

PATENT Docket No. 511582002420

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Tami M. Procopio

#### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Aya Jakobovits, et al.

Serial No.:

10/001,469

Filing Date:

October 31, 2001

For:

NUCLEIC ACID AND CORRESPONDING

PROTEINS ENTITLED 101P3A11 USEFUL IN TREATMENT AND

**DETECTION OF CANCER** 

Examiner: To be Assigned

Group Art Unit: 1642

#### **AMENDMENT**

Box Missing Parts Assistant Commissioner For Patents Washington, D.C. 20231

Dear Sir:

This is in response to the Notice to file missing parts of non-provisional application mailed December 20, 2001, for which a response is due on February 20, 2002. A petition for an extension of time of three (3) months until 20 May 2002 is attached hereto, along with the required fee.

Please enter the following sequence listing, amendments and remarks.

#### In the Specification

On page 1, line 26, please insert new paragraph as follows:

#### --SUBMISSION ON COMPACT DISC

The contents of the following submission on compact discs are incorporated herein by reference in its entirety: A compact disc copy of the Sequence Listing (COPY 1) (file name: 2002420, date recorded: February 16, 2002, size: 569 KB); a duplicate compact disc copy of Sequence Listing (COPY 2) (file name: 2002420, date recorded: February 16, 2002, size: 569 KB); a computer readable form copy of the Sequence Listing (CRF COPY) (file name: 2002420, date recorded: February 16, 2002, size: 569 KB).--

#### In the Sequence Listing

Please insert the attached compact disc copy of the Sequence Listing on CD-R (COPY 1) in the above-captioned application. A duplicate compact disc copy of the Sequence Listing on CD-R (COPY 2) and a computer readable form copy of the Sequence Listing on CD-R (CRF COPY) accompany this response.

#### **AMENDMENTS**

#### In the Specification:

Please replace the paragraph beginning at page 7, line 21, with the following rewritten paragraph:

-- Figure 1. 101P3A11 SSH sequence (SEQ ID NO:2960). The 101P3A11 SSH sequence.--

Please replace the paragraph beginning at page 7, line 22, with the following rewritten paragraph:

-- Figures 2A-2D. The cDNA (SEQ ID. NO. :2961) and amino acid sequence (SEQ ID. NO. :2962) of 101P3A11. The start methionine is underlined. The open reading frame extends from nucleic acid 133 to 1086 including the stop codon (the codon for the initial M is omitted as the shorter peptide has a more favorable Kozak sequence).--

Please replace the paragraph beginning at page 7, line 26, with the following rewritten paragraph:

--Figure 3. Amino acid sequence of 101P3A11 (SEQ ID. NO. :piece of 2962). The 101P3A11 protein has 317 amino acids.--

Please replace the paragraph beginning at page 7, line 28, with the following rewritten paragraph:

--Figure 4. Alignment of 101P3A11 (Sbjct) (SEQ ID NO: 2964) with mouse olfactory receptor S25 (Query.) (SEQ ID NO: 2963) The transmembrane regions of 101P3A11 and mouse olfactory receptor S25 (ORS25)predicted using the TMHMM algorithm are highlighted in gray. The amino acids of ORS25 predicted (Floriano, W.B., et al, 2000, Proc. Natl. Acad. Sci., USA, 97:10712-10716) to be involved in binding of the ligand hexanol and/or involved in the formation of the ligand binding pocket are italicized and bolded in the Figure, and are: Leu 131, Val 134, Val 135, Gly 138, Thr139, Ser 193, Ser 197, Phe 225, Ala 230, Ile 231, Gly 234, Thr 284, Phe 287, Gln 300, Lys 302.--

Please replace the paragraph beginning at page 11, line 31, with the following rewritten paragraph:

--Figure 23. Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2965) with the rat (SEQ ID NO: 2966) GPCR RA1C (gi|3420759). Identities = 179/299 (59%), Positives = 231/299 (76%), Gaps = 1/299 (0%).--

Please replace the paragraph beginning at page 12, line 1, with the following rewritten paragraph:

--Figure 24. Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2967) with the human prostate specific GPCR (SEQ ID NO: 2968) (gi|13540539). Identities = 179/299 (59%), Positives = 233/299 (77%), Gaps = 1/299 (0%).--

Please replace the paragraph beginning at page 12, line 3, with the following rewritten paragraph:

--Figure 25. Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2969) with human olfactory receptor 5II12, HOR5 (SEQ ID NO: 2970) (gi|14423836). Identities = 163/304 (53%), Positives = 214/304 (69%), Gaps = 1/304 (0%).--

Please replace the paragraph beginning at page 36, line 20, with the following rewritten paragraph:

--Also, different MHC class I molecules prefer a different length of ligands. For example, SYFPEITHI offers predictions for H2-Kb octamers, HLA-A\*0201 nonamers and decamers, or HLA-B8 octamers and nonamers. The maximal scores vary between different MHC alleles. Therefore, one can include known ligands/epitopes in order to have an approximation of the scoring. For example, the maximal score for HLA-A\*0201 peptides is 36. The well-known epitope GILGFVFTL (SEQ ID NO: 1401) derived from the influenza A matrix protein scores 30. All predicted MHC class II ligands are 15mers, consisting of three N-terminal flanking residues, the nonamer core sequence located within the binding groove, and three C-terminal flanking residues. Thus, anchor residue P1 appears in position 4 of the peptides predicted with "SYFPEITHI".--

Please replace the paragraph beginning at page 37, line 25, with the following rewritten paragraph:

--In an embodiment described in the examples that follow, 101P3A11 can be conveniently expressed in cells (such as 293T cells) transfected with a commercially available expression vector such as a CMV-driven expression vector encoding 101P3A11 with a C-terminal 6XHis (SEQ ID NO: 1402) and MYC tag (pcDNA3.1/mycHIS, Invitrogen or Tag5, GenHunter Corporation, Nashville TN). The Tag5 vector provides an IgGK secretion signal that can be used to facilitate the production of a secreted 101P3A11 protein in transfected cells. The secreted HIS-tagged 101P3A11 in the culture media can be purified, e.g., using a nickel column using standard techniques.--

Please replace the paragraph beginning at page 70, line 3, with the following rewritten paragraph:

--In certain embodiments, the T helper peptide is one that is recognized by T helper cells present in a majority of a genetically diverse population. This can be accomplished by selecting peptides that bind to many, most, or all of the HLA class II molecules. Examples of such amino acid bind many HLA Class II molecules include sequences from antigens such as tetanus toxoid at positions 830-843 (QYIKANSKFIGITE; (SEQ ID NO: 1403), *Plasmodium falciparum* circumsporozoite (CS) protein at positions 378-398 (DIEKKIAKMEKASSVFNVVNS; (SEQ ID NO: 1404), and *Streptococcus* 18kD protein at positions 116-131 (GAVDSILGGVATYGAA; (SEQ ID NO: 1405). Other examples include peptides bearing a DR 1-4-7 supermotif, or either of the DR3 motifs.--

Please replace the paragraph beginning at page 70, line 11, with the following rewritten paragraph:

--Alternatively, it is possible to prepare synthetic peptides capable of stimulating T helper lymphocytes, in a loosely HLA-restricted fashion, using amino acid sequences not found in nature (*see*, *e.g.*, PCT publication WO 95/07707). These synthetic compounds called Pan-DR-binding epitopes (*e.g.*, PADRE™, Epimmune, Inc., San Diego, CA) are designed to most preferably bind most HLA-DR (human HLA class II) molecules. For instance, a pan-DR-

binding epitope peptide having the formula: aKXVAAWTLKAAa (SEQ ID NO: 1406), where "X" is either cyclohexylalanine, phenylalanine, or tyrosine, and a is either D-alanine or L-alanine, has been found to bind to most HLA-DR alleles, and to stimulate the response of T helper lymphocytes from most individuals, regardless of their HLA type. An alternative of a pan-DR binding epitope comprises all "L" natural amino acids and can be provided in the form of nucleic acids that encode the epitope.--

Please replace the paragraph beginning at page 80, line 16, with the following rewritten paragraph:

--Single chain antibodies comprise the variable domains of the heavy and light chain joined by a flexible linker polypeptide, and are expressed as a single polypeptide. Optionally, single chain antibodies are expressed as a single chain variable region fragment joined to the light chain constant region. Well-known intracellular trafficking signals are engineered into recombinant polynucleotide vectors encoding such single chain antibodies in order to precisely target the intrabody to the desired intracellular compartment. For example, intrabodies targeted to the endoplasmic reticulum (ER) are engineered to incorporate a leader peptide and, optionally, a C-terminal ER retention signal, such as the KDEL (SEQ ID NO: 1407) amino acid motif. Intrabodies intended to exert activity in the nucleus are engineered to include a nuclear localization signal. Lipid moieties are joined to intrabodies in order to tether the intrabody to the cytosolic side of the plasma membrane. Intrabodies can also be targeted to exert function in the cytosol. For example, cytosolic intrabodies are used to sequester factors within the cytosol, thereby preventing them from being transported to their natural cellular destination.--

Please replace the paragraph beginning at page 86, line 29, with the following rewritten paragraph:

--pGEX Constructs: To generate recombinant 101P3A11 proteins in bacteria that are fused to the Glutathione S-transferase (GST) protein, all or parts of the 101P3A11 cDNA protein coding sequence are fused to the GST gene by cloning into pGEX-6P-1 or any other GST- fusion vector of the pGEX family (Amersham Pharmacia Biotech, Piscataway, NJ). These constructs allow controlled expression of recombinant 101P3A11 protein sequences with GST fused at the amino-terminus and a six histidine epitope (6X His) (SEQ ID NO: 1402) at the carboxyl-

terminus. The GST and 6X His tags permit purification of the recombinant fusion protein from induced bacteria with the appropriate affinity matrix and allow recognition of the fusion protein with anti-GST and anti-His antibodies. The 6X His tag (SEQ ID NO: 1402) is generated by adding 6 histidine (SEQ ID NO: 1402) codons to the cloning primer at the 3' end, e.g., of the open reading frame (ORF). A proteolytic cleavage site, such as the PreScission<sup>TM</sup> recognition site in pGEX-6P-1, can be employed that permits cleavage of the GST tag from 101P3A11-related protein. The ampicillin resistance gene and pBR322 origin permit selection and maintenance of the pGEX plasmids in *E. coli*. In one embodiment, amino acids 86-317 are cloned into the pGEX-2T expression vector, the protein is expressed and purified.--

Please replace the paragraph beginning at page 87, line 8, with the following rewritten paragraph:

--pMAL Constructs: To generate, in bacteria, recombinant 101P3A11 proteins that are fused to maltose-binding protein (MBP), all or parts of the 101P3A11 cDNA protein coding sequence are fused to the MBP gene by cloning into the pMAL-c2X and pMAL-p2X vectors (New England Biolabs, Beverly, MA). These constructs allow controlled expression of recombinant 101P3A11 protein sequences with MBP fused at the amino-terminus and a 6X His (SEQ ID NO: 1402) epitope tag at the carboxyl-terminus. The MBP and 6X His tags (SEQ ID NO: 1402) permit purification of the recombinant protein from induced bacteria with the appropriate affinity matrix and allow recognition of the fusion protein with anti-MBP and anti-His antibodies. The 6X His (SEQ ID NO: 1402) epitope tag is generated by adding 6 histidine (SEQ ID NO: 1402) codons to the 3' cloning primer. A Factor Xa recognition site permits cleavage of the pMAL tag from 101P3A11. The pMAL-c2X and pMAL-p2X vectors are optimized to express the recombinant protein in the cytoplasm or periplasm respectively. Periplasm expression enhances folding of proteins with disulfide bonds. In one embodiment, amino acids 86-310 is cloned into the pMAL-c2X expression vector, the protein is expressed and purified.--

Please replace the paragraph beginning at page 87, line 20, with the following rewritten paragraph:

--pET Constructs: To express 101P3A11 in bacterial cells, all or parts of the 101P3A11 cDNA protein coding sequence are cloned into the pET family of vectors (Novagen, Madison, WI). These vectors allow tightly controlled expression of recombinant 101P3A11 protein in bacteria with and without fusion to proteins that enhance solubility, such as NusA and thioredoxin (Trx), and epitope tags, such as 6X His (SEQ ID NO: 1402) and S-Tag ™ that aid purification and detection of the recombinant protein. For example, constructs are made utilizing pET NusA fusion system 43.1 such that regions of the 101P3A11 protein are expressed as amino-terminal fusions to NusA.--

Please replace the paragraph beginning at page 88, line 19, with the following rewritten paragraph:

--pcDNA4/HisMax Constructs: To express 101P3A11 in mammalian cells, the 101P3A11 ORF was cloned into pcDNA4/HisMax Version A (Invitrogen, Carlsbad, CA). Protein expression is driven from the cytomegalovirus (CMV) promoter and the SP16 translational enhancer. The recombinant protein has Xpress<sup>TM</sup> and six histidine (6X His) (SEQ ID NO: 1402) epitopes fused to the amino-terminus. The pcDNA4/HisMax vector also contains the bovine growth hormone (BGH) polyadenylation signal and transcription termination sequence to enhance mRNA stability along with the SV40 origin for episomal replication and simple vector rescue in cell lines expressing the large T antigen. The Zeocin resistance gene allows for selection of mammalian cells expressing the protein and the ampicillin resistance gene and CoIE1 origin permits selection and maintenance of the plasmid in *E. coli.*--

Please replace the paragraph beginning at page 88, line 28, with the following rewritten paragraph:

--pcDNA3.1/MycHis Constructs: To express 101P3A11 in mammalian cells, the 101P3A11 ORF, with a consensus Kozak translation initiation site, was cloned into pcDNA3.1/MycHis Version A (Invitrogen, Carlsbad, CA). Protein expression is driven from the cytomegalovirus (CMV) promoter. The recombinant proteins have the myc epitope and 6X His (SEQ ID NO: 1402) epitope fused to the carboxyl-terminus. The pcDNA3.1/MycHis vector also contains the bovine growth hormone (BGH) polyadenylation signal and transcription termination sequence to enhance mRNA stability, along with the SV40 origin for episomal replication and

simple vector rescue in cell lines expressing the large T antigen. The Neomycin resistance gene can be used, as it allows for selection of mammalian cells expressing the protein and the ampicillin resistance gene and ColE1 origin permits selection and maintenance of the plasmid in *E. coli.*--

Please replace the paragraph beginning at page 89, line 16, with the following rewritten paragraph:

--PAPtag: The 101P3A11 ORF, or portions thereof, of 101P3A11 are cloned into pAPtag-5 (GenHunter Corp. Nashville, TN). This construct generates an alkaline phosphatase fusion at the carboxyl-terminus of the 101P3A11 proteins while fusing the IgGκ signal sequence to the amino-terminus. Constructs are also generated in which alkaline phosphatase with an amino-terminal IgGκ signal sequence is fused to the amino-terminus of 101P3A11 proteins. The resulting recombinant 101P3A11 proteins are optimized for secretion into the media of transfected mammalian cells and can be used to identify proteins such as ligands or receptors that interact with the 101P3A11 proteins. Protein expression is driven from the CMV promoter and the recombinant proteins also contain myc and 6X His (SEQ ID NO: 1402) epitopes fused at the carboxyl-terminus that facilitates detection and purification. The Zeocin resistance gene present in the vector allows for selection of mammalian cells expressing the recombinant protein and the ampicillin resistance gene permits selection of the plasmid in *E. coli.*--

Please replace the paragraph beginning at page 89, line 27, with the following rewritten paragraph:

--ptag5: The 101P3A11 ORF, or portions thereof, of 101P3A11 are cloned into pTag-5. This vector is similar to pAPtag but without the alkaline phosphatase fusion. This construct generated 101P3A11 protein with an amino-terminal IgGκ signal sequence and myc and 6X His (SEQ ID NO: 1402) epitope tags at the carboxyl-terminus that facilitate detection and affinity purification. The resulting recombinant 101P3A11 protein was optimized for secretion into the media of transfected mammalian cells, and was used as immunogen or ligand to identify proteins such as ligands or receptors that interact with the 101P3A11 proteins. Protein expression is driven from the CMV promoter. The Zeocin resistance gene present in the vector allows for

selection of mammalian cells expressing the protein, and the ampicillin resistance gene permits selection of the plasmid in *E. coli.*--

Please replace the paragraph beginning at page 90, line 30, with the following rewritten paragraph:

--Additional pSRα constructs are made that fuse an epitope tag such as the FLAG<sup>TM</sup> tag to the carboxyl-terminus of 101P3A11 sequences to allow detection using anti-Flag antibodies. For example, the FLAG<sup>TM</sup> sequence 5' gat tac aag gat gac gac gat aag 3' (SEQ ID NO: 1408) is added to cloning primer at the 3' end of the ORF. Additional pSRα constructs are made to produce both amino-terminal and carboxyl-terminal GFP and myc/6X His (SEQ ID NO: 1402) fusion proteins of the full-length 101P3A11 proteins.--

Please replace the paragraph beginning at page 141, line 31, with the following rewritten paragraph:

--The generation of anti-101P3A11 polyclonal Ab (pAb) using an amino-terminal peptide encoding amino acids 1-14 (MVDPNGNESSATYF; (SEQ ID NO: 1409) as antigen was reported in our Priority Application. The effect of this antibody on 101P3A11 mediated ERK phosphorylation (Figure 38) and cAMP accumulation (Figure 39) was determined. 293T cells were transfected with control or 101P3A11 cDNA. Cells were allowed to rest overnight, and treated with anti-101P3A11 or control Ab in the presence of 0.5% or 10% FBS. Cells were lysed and analyzed by Western blotting with anti-Phospho-ERK and anti-ERK mAb. Figure 38 shows that expression of 101P3A11 induces ERK phosphorylation in cells treated with 0.5 or 10% FBS. Anti-101P3A11 pAb reduced the phosphorylation of ERK in 293T-101P3A11 cells treated with 0.5% FBS. The ERK overlay demonstrated equal loading, supporting the specificity of this data.--

Please replace Table XIX, beginning at page 186, with the following rewritten Table XIX:

-- Table XIX: Motifs and Post-translational Modifications of 101P3A11

N-glycosylation site

Number of matches: 3

- 7-10 NESS (SEQ ID NO: 1410)
- 2 44-47 NLTI (SEQ ID NO: 1411)
- 90-93 NSTT (SEQ ID NO: 1412)



cAMP- and cGMP-dependent protein kinase phosphorylation site 268-271 RRDS (SEQ ID NO: 1413)

Protein kinase C phosphorylation site 266-268 SKR

Casein kinase II phosphorylation site Number of matches: 3

- 56-59 SLHE (SEQ ID NO: 1414) 69-72 SGID (SEQ ID NO: 1415)
- 110-113 SGME (SEQ ID NO: 1416)

N-myristoylation site

Number of matches: 4

- 6-11 GNESSA (SEQ ID NO: 1417)
- 2 21-26 GLEEAQ (SEQ ID NO: 1418) 3 111-116 GMESTV (SEQ ID NO: 1419)
- 4 240-245 GTCVSH (SEQ ID NO: 1420)

G-protein coupled receptors family 1 signature

112-128 MESTVLLAMAFDRYVAI (SEQ ID NO: 1421)--

Please replace Table XXI, beginning at page 190, line 1, with the following rewritten Table XXI:

--Table XXI: Nucleotide sequence of the splice variant (SEQ ID NO: 1422)

| 1   | CACATTCCTT | CCATACGGTT | GAGCCTCTAC | CTGCCTGGTG | CTGGTCACAG | TTCAGCTTCT |
|-----|------------|------------|------------|------------|------------|------------|
| 61  | TCATGATGGT | GGATCCCAAT | GGCAATGAAT | CCAGTGCTAC | ATACTTCATC | CTAATAGGCC |
| 121 | TCCCTGGTTT | AGAAGAGGCT | CAGTTCTGGT | TGGCCTCCCA | TTGTGCTCCC | TCTANCTATG |
| 181 | CTGTGCTAGT | AATTGACAAT | CATCTACATG | TGCGGACGAG | CACGNCGCNG | AGCCCNGTAT |
| 241 | NATTCTGCNG | CTTCAGCATG | ACACCCTNCA | GTCTCAGCCA | AAGNGCATCT | CNGTCAATCA |
| 301 | NACACNTGAG | CTGTCGTACG | AGTTGCATCA | TCCTANGGCA | GGATCAATGT | GCGGNAGGCN |
| 361 | TGACGCAGTG | CACGTACCAT | GGCAGCAAGA | CAGGGCCGGT | ACAAATGGGG | GCGAGNCGGG |
| 421 | GTGAAGATGN | ACCCTCGGGT | CANAGAGTGC | CTCTGCGCCA | AAACCTCCAT | CATGNNAACA |
| 481 | GNGTATAACG | GCGNAGAATC | GGNNANGCGC | AAGGCTAAGG | AAANNCCCAA | NNCNGGTACT |
| 541 | TTAACCCNGC | AAANGGCANC | NAAACGGGNG | GGTNANTGAA | CAAGGAAGGN | NTGNAACTGG |
| 601 | GCCAAAACGG | GNTGGGCAAN | NNAAGGACTC | ATGGGNCCAA | GGGACGGNAA | AAGGGGNAAN |
| 661 | CGGGGCGAAA | TGNNAAAAAC | CGGGNCCCGG | GGAANAANGA | AGGGGAANAN | GNGTGAAGĢA |
| 721 | CNGGGTTCAA | GGGAAAAGNA | AAACCANGGG | NNAGAAACCN | TTCNAANGGC | CCGGGNANGA |

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781 AAGGAANTNN GNNNGGNGAA AAAATCNAAA AAAAGCNGNG GCNNAAAAAN GGGGGGAANN
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- 841 NAAANACCNN GGNCGNNAAA AAACNNAANG NGGGGGGANT ANACACGGAA ANNNANGGGC
- 901 GNNNAAGGGA AATAANNCGG GAACNAAAGN GCAAACCGNA CGGNAGGAAC GAAACCCACC
- 961 GGAGNCGCNN AACGCCNNNC NNANCCCGAG CNGAGGTNG--

Please replace Table XXII, beginning at page 190, line 38, with the following rewritten Table XXII:

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-Table XXII: Nucleotide sequence alignment of 101P3A11 with the splice variant.
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```
Score = 337 bits (175), Expect = 4e-89 Identities = 215/223 (96%), Gaps = 6/223 (2%) Strand = Plus / Plus
```

Please replace Table XXIII, beginning at page 191, line 8, with the following rewritten Table XXIII:

```
--Table XXIII: Longest single amino acid sequence alignment of 101P3A11 and the splice variant.
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Score = 134 bits (287), Expect(2) = 3e-29 Identities = 51/51 (100%) Frame = +1 / +3
```

101P3A11: 70 HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA 222 (SEQ ID NO: 1425)

(SEQ ID NO: 1425)

HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA

Variant : 3 HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA 155

(SEQ ID NO: 1426)--

Please replace Table XXIV, beginning at page 191, line 16, with the following rewritten Table XXIV:

--Table XXIV: Peptide sequences from the translation of the nucleotide sequence of the splice variant .

| sequence or the | sprice varianc.  |
|-----------------|--|
| Open reading    | Amino acid sequences   |
| frame           |  |
| Frame 1 (SEQ ID | HIPSIRLSLYLPGAGHSSASS*WWIPMAMNPVLHTSS**ASLV*KRLSSGWPPIVLPLXM |
| NO: 1427)       | LC**LTIIYMCGRARRXAXYXSAASA*HPXVSAKXHLXQSXT*AVVRVASSXGRINVRXA |
|                 | *RSARTMAARQGRYKWGRXGVKMXPRVXECLCAKTSIMXTXYNGXESXXRKAKEXPXXGT |
|                 | LTXQXAXKRXGX*TRKXXNWAKTGWAXXGLMGPRDGKRGXRGEMXKTGXRGXXKGXXXEG |
|                 | XGSREKXNXGXETXXXARXXKEXXXXKKSKKSXGXKXGGXXXPXXXKNXXXGXXTRKXXG |
|                 | XXGK*XGNXXANRTXGTKPTGXAXRXXXPEXRX                            |
| Frame 2(SEQ ID  | TFLPYG*ASTCLVLVTVQLLHDGGSQWQ*IQCYILHPNRPPWFRRGSVLVGLPLCSLXLC |
| NO: 1428)       | CASN*QSSTCADEHXAEPXXILXLQHDTLQSQPKXISVNXTXELSYELHHPXAGSMCGRX |
|                 | DAVHVPWQQDRAGTNGGEXG*RXTLGSXSASAPKPPSXXQXITAXNRXXARLRKXPXXVL |
|                 | *PXKXXXNGXVXEQGRXXTGPKRXGQXKDSWXQGTXKGXXGAKXXKPGPGEXXRGXXVKD |
|                 | XVQGKXKTXGXKPFXXPGXERXXXXXKNXKKAXAXKXGEXKXXGRXKTXXGGXXHGXXXA |
|                 | XKGNXXGTKXQTXRXERNPPEXXNAXXXPSXG                             |
| Frame 3(SEQ ID  | HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLASHCAPSXYA |
| NO: 1429)       | VLVIDNHLHVRTSTXXSPVXFCXFSMTPXSLSQXASXSIXHXSCRTSCIILXQDQCAXGX |
|                 | TQCTYHGSKTGPVQMGAXRGEDXPSGXRVPLRQNLHHXNXV*RRRIGXAQG*GXXQXXYF |
|                 | NPAXGXXTGGXXNKEGXXLGQNGXGXXRTHGXKGRXKGXXGRNXKNRXPGXXEGEXX*RT |
|                 | GFKGKXKPXXRNXSXGPGXKGXXXGEKIXKKXXXKXGGXXXTXXXKKXXXGGXXTEXXGR |
|                 | XREIXREXKXKPXGRNETHRXRXTPXXXRAEV                             |

Note: Frame 3 gives the longest subsequence that is identical with 101P3All amino acid sequence. In this Table each (\*)indicates the product of a single stop codon, and 'X' indicates a single unknown amino acid.--

Please replace Table XXVI, beginning at page 193, line 1, with the following rewritten Table XXVI:

#### --Table XXVI:

HLA Class I Nonamers (SEQ ID NOS 1430-1462, respectively in order of appearance)

| Ī  | ILA-A1 | nc | nc                                   | me | ers          | 3 |   |                          |   |   |       |
|----|--------|----|--------------------------------------|----|--------------|---|---|--------------------------|---|---|-------|
|    | Pos    | 1  | 2                                    | 3  | 4            | 5 | 6 | 7                        | 8 | 9 | score |
| 1  | 245    | Н  | v                                    | C  | Α            | V | F | $\underline{\mathtt{I}}$ | F | Y | 24    |
| 2  | 29     | L  | A                                    | F  | P            | L | C | $\underline{s}$          | L | Y | 21    |
| 3  | 41     | V  | $\overline{\Gamma}$                  | G  | N            | L | T | I                        | I | Y | 21    |
| 4  | 285    | P  | $\underline{\mathtt{P}}$             | v  | $\mathbf{L}$ | N | P | Ī                        | V | Y | 20    |
| 5  | 111    | G  | M                                    | E  | S            | T | V | $\underline{\mathbf{L}}$ | L | A | 19    |
| 6  | 117    | L  | $\underline{\mathbf{r}}$             | A  | M            | A | F | $\overline{\mathtt{D}}$  | R | Y | 19    |
| 7  | 172    | R  | $\underline{\mathbf{s}}$             | N  | 1            | L | S | $\overline{\mathbf{H}}$  | S | Y | 19    |
| 8  | 192    | D  | $\underline{\mathtt{D}}$             | I  | R            | V | N | $\overline{\Lambda}$     | ٧ | Y | 19    |
| 9  | 212    | D  | $\underline{s}$                      | L  | $\mathbf{L}$ | Ι | S | $\underline{\mathbf{F}}$ | S | Y | 19    |
| 10 | 57     | L  | <u>H</u>                             | E  | P            | M | Y | Ī                        | F | L | 18    |
| 11 | 22     | L  | $\underline{\underline{\mathbf{E}}}$ | E  | A            | Q | F | W                        | L | A | 17    |
| 12 | 9      | s  | $\underline{\mathbf{s}}$             | A  | Т            | Y | F | Ī                        | L | I | 16    |
| 13 | 52     | R  | $\underline{\mathbf{T}}$             | E  | H            | s | L | H                        | E | P | 16    |

| 1  | HLA-A1 | nc | nc                          | me | ers | 3            |   |                                      |   |   |       |
|----|--------|----|-----------------------------|----|-----|--------------|---|--------------------------------------|---|---|-------|
|    | Pos    | 1  | 2                           | 3  | 4   | 5            | 6 | 7                                    | 8 | 9 | score |
| 14 | 54     | E  | H                           | s  | L   | Н            | E | <u>P</u>                             | Μ | Y | 16    |
| 15 | 78     | S  | $\underline{\mathbf{s}}$    | M  | P   | K            | М | $\underline{\mathbf{L}}$             | Α | I | 16    |
| 16 | 95     | Q  | $\mathbf{F}$                | D  | A   | C            | L | $\overline{\mathbf{r}}$              | Q | I | 16    |
| 17 | 159    | Α  | P                           | L  | P   | V            | F | Ī                                    | K | Q | 16    |
| 18 | 183    | Н  | Q                           | D  | V   | М            | K | $\underline{\underline{\mathbf{L}}}$ | Α | С | 16    |
| 19 | 1      | М  | $\underline{\underline{V}}$ | D  | P   | N            | G | $\underline{N}$                      | E | S | 15    |
| 20 | 5      | N  | $\underline{\mathbf{G}}$    | N  | E   | s            | S | <u>A</u>                             | T | Y | 15    |
| 21 | 210    | G  | $\underline{\mathbf{L}}$    | D  | S   | $\mathbf{L}$ | L | Ī                                    | s | F | 15    |
| 22 | 273    | L  | <u>P</u>                    | v  | I   | L            | A | N                                    | I | Y | 15    |
| 23 | 271    | S  | $\underline{\mathbf{P}}$    | L  | P   | V            | Ι | $\overline{\mathbf{L}}$              | Α | N | 14    |
| 24 | 91     | S  | $\underline{\mathbf{T}}$    | T  | I   | Q            | F | $\underline{\mathtt{D}}$             | Α | С | 13    |
| 25 | 121    | Α  | F                           | D  | R   | Y            | V | $\underline{\underline{A}}$          | 1 | С | 13    |
| 26 | 138    | L  | $\underline{\mathbf{T}}$    | L  | P   | R            | V | $\underline{\mathtt{T}}$             | K | I | 13    |
| 27 | 218    | F  | s                           | Y  | L   | $\mathbf{L}$ | I | $\underline{\mathbf{r}}$             | K | T | 13    |
| 28 | 282    | L  | Ŀ                           | v  | P   | P            | V | $\underline{\mathbf{L}}$             | N | P | 13    |
| 29 | 190    | Α  | $\underline{c}$             | D  | D   | I            | R | $\underline{v}$                      | N | v | 12    |
| 30 | 191    | С  | $\overline{\mathbf{D}}$     | D  | I   | R            | ٧ | N                                    | V | v | 12    |
| 31 | 231    | Т  | R                           | E  | A   | Q            | A | K                                    | Α | F | 12    |
| 32 | 268    | R  | $\underline{R}$             | D  | s   | P            | L | P                                    | V | I | 12    |
| 33 | 270    | D  | <u>s</u>                    | P  | L   | P            | V | Ī                                    | L | A | 12    |
|    |        |    |                             |    |     |              |   |                                      |   |   |       |

#### HLA-A\*0201 nonomers(SEQ ID NOS 1463-1569, respectively in order of appearance)

|    | Pos | 1 | 2 | 3       | 4 | 5            | 6                           | 7 | 8 | 9 | score |
|----|-----|---|---|---------|---|--------------|-----------------------------|---|---|---|-------|
| 1  | 287 | v | L | N       | P | I            | v                           | Y | G | v | 30    |
| 2  | 14  | F | I | L       | I | G            | L                           | P | G | L | 29    |
| 3  | 28  | W | L | Α       | F | P            | L                           | С | s | L | 28    |
| 4  | 37  | Y | L | I       | Α | v            | $\overline{\Gamma}$         | G | N | L | 28    |
| 5  | 222 | L | I | L       | K | Т            | $\underline{v}$             | L | G | L | 28    |
| 6  | 66  | С | M | L       | s | G            | Ī                           | D | Ι | L | 26    |
| 7  | 108 | S | L | s       | G | М            | E                           | S | T | v | 26    |
| 8  | 181 | С | L | Н       | Q | D            | $\underline{v}$             | М | K | L | 26    |
| 9  | 201 | G | L | 1       | V | I            | I                           | S | A | I | 26    |
| 10 | 214 | L | L | I       | s | F            | S                           | Y | L | L | 26    |
| 11 | 275 | V | I | L       | Α | N            | Ī                           | Y | L | L | 26    |
| 12 | 157 | L | M | A       | P | L            | P                           | V | F | I | 25    |
| 13 | 220 | Y | L | L       | Ι | L            | K                           | Т | V | L | 25    |
| 14 | 276 | I | L | Α       | N | Ι            | $\underline{\underline{Y}}$ | L | L | v | 25    |
| 15 | 279 | N | I | Y       | L | $\mathbf{r}$ | $\underline{v}$             | P | P | v | 25    |
| 16 | 138 | L | T | L       | P | R            | $\underline{v}$             | T | K | I | 24    |
| 17 | 213 | s | L | L       | I | S            | F                           | s | Y | L | 24    |
| 18 | 49  | Y | I | V       | R | T            | $\underline{\mathbf{E}}$    | Н | S | L | 23    |
| 19 | 143 | V | T | K       | Ι | G            | V                           | Α | A | v | 23    |
| 20 | 188 | K | L | Α       | C | D            | $\underline{\mathbf{D}}$    | I | R | v | 23    |
| 21 | 198 | v | v | Y       | G | L            | I                           | V | 1 | Ι | 23    |
| 22 | 21  | G | L | E       | E | Α            | Q                           | F | W | L | 22    |
| 23 | 40  | Α | v | ${f L}$ | G | N            | $\overline{\Gamma}$         | Т | Ι | I | 22    |
| 24 | 206 | I | s | Α       | I | G            | L                           | D | S | L | 22    |
| 25 | 11  | Α | T | Y       | F | 1            | Ŀ                           | I | G | L | 21    |
| 26 | 60  | P | M | Y       | I | F            | L                           | C | M | L | 21    |
|    |     |   |   |         |   |              |                             |   |   |   | 14    |

HLA-A\*0201 nonomers(SEQ ID NOS 1463-1569, respectively in order of appearance)

|    |     |     | -   | - |   |   |   |   |   |       |
|----|-----|-----|-----|---|---|---|---|---|---|-------|
|    | Pos | 1 2 | 2 3 | 4 | 5 | 6 | 7 | 8 | 9 | score |
| 27 | 135 | A   |     | L | Т | L | P | R | v | 21    |
| 28 | 160 | PΙ  |     | v | F | I | K | Q | L | 21    |
| 29 | 174 | N   |     | s | Н | s | Y | c | L | 21    |
| 30 | 207 | SI  |     | G | L | D | s | L | L | 21    |
| 31 | 272 | PΙ  |     | v | Ι | L | A | N | I | 21    |
| 32 | 283 | ь 1 |     | p | V | L | N | P | I | 21    |
| 33 | 67  | мі  |     | G | I | D | I | L | I | 20    |
| 34 | 101 | L   |     | F | A | I | H | s | L | 20    |
| 35 | 282 | LI  |     | P | P | v | L | N | P | 20    |
| 36 | 299 | E   |     | Q | R | ī | L | R | L | 20    |
| 37 | 304 | II  |     | L | F | Н | V | A | т | 20    |
| 38 | 39  | I A |     | L | G | N | L | Т | I | 19    |
| 39 | 45  | L 7 |     | I | Y | I | v | R | т | 19    |
| 40 | 92  | т 7 |     | Q | F | D | Α | С | L | 19    |
| 41 | 110 | s   |     | Ē | s | T | v | L | L | 19    |
| 42 | 127 | Α ] |     | Н | P | L | R | Н | A | 19    |
| 43 | 132 | LF  |     | Α | Т | v | L | Т | L | 19    |
| 44 | 149 | A 2 |     | V | R | G | A | A | L | 19    |
| 45 | 155 | A I |     | М | A | P | L | P | v | 19    |
| 46 | 156 | AI  |     | Α | P | L | P | v | F | 19    |
| 47 | 203 | 1 1 |     | Ι | s | A | I | G | L | 19    |
| 48 | 208 | A I |     | L | D | s | L | L | I | 19    |
| 49 | 216 | IS  |     | s | Y | L | L | I | L | 19    |
| 50 | 219 | SY  |     | L | I | L | ĸ | T | v | 19    |
| 51 | 221 | LI  |     | L | K | T | V | L | G | 19    |
| 52 | 223 | II  |     | Т | V | L | G | L | T | 19    |
| 53 | 17  | I   |     | p | G | L | E | E | A | 18    |
| 54 | 33  | ьc  |     | L | Y | L | I | A | v | 18    |
| 55 | 34  | C S |     | Y | L | T | Α | v | L | 18    |
| 56 | 38  | LI  | : A | v | L | G | N | L | т | 18    |
| 57 | 43  | G 1 |     | т | I | I | Y | I | v | 18    |
| 58 | 85  | A I | F   | W | F | N | S | Т | т | 18    |
| 59 | 118 | L A | М   | Α | F | D | R | Y | v | 18    |
| 60 | 194 | ΙF  | v   | N | v | v | Y | G | L | 18    |
| 61 | 210 | GI  | D   | s | L | L | I | s | F | 18    |
| 62 | 215 | LI  | s   | F | s | Y | L | L | I | 18    |
| 63 | 246 | v c | : A | v | F | I | F | Y | v | 18    |
| 64 | 254 | VE  | F   | Ι | G | L | s | М | v | 18    |
| 65 | 15  | II  | ·I  | G | L | P | G | L | E | 17    |
| 66 | 63  | I   | . Г | С | М | L | s | G | I | 17    |
| 67 | 72  | D 1 | : ь | Ι | s | T | S | S | М | 17    |
| 68 | 93  | T I | Q   | F | D | A | С | L | L | 17    |
| 69 | 98  | A C |     | L | Q | I | F | A | I | 17    |
| 70 | 111 | G N |     | s | T | v | L | L | A | 17    |
| 71 | 120 | M A | F   | D | R | Y | v | Α | I | 17    |
| 72 | 167 | QI  |     | F | С | R | s | N | I | 17    |
| 73 | 197 | NV  |     | Y | G | L | Ι | v | I | 17    |
| 74 | 226 | Т   |     | G | L | T | R | E | A | 17    |
| 75 | 281 | ΥI  |     | v | Р | P | v | L | N | 17    |
|    |     |     |     |   |   | _ |   |   |   | 15    |
|    |     |     |     |   |   |   |   |   |   |       |

HLA-A\*0201 nonomers(SEQ ID NOS 1463-1569, respectively in order of appearance)

|     | Pos | 1 | 2 | 3 | 4            | 5            | 6                        | 7 | 8 | 9 | score |
|-----|-----|---|---|---|--------------|--------------|--------------------------|---|---|---|-------|
| 76  | 31  | F | P | L | C            | s            | Г                        | Y | L | I | 16    |
| 77  | 56  | s | L | Н | E            | P            | ≟<br>M                   | Y | I | F | 16    |
| 78  | 70  | G | I | D | I            | L            | ï                        | s | Т | s | 16    |
| 79  | 78  | s | S | М | P            | K            | =<br>M                   | L | A | I | 16    |
| 80  | 79  | S | м | Р | K            | М            | L                        | A | Ι | F | 16    |
| 81  | 104 | F | Α | I | Н            | s            | L                        | s | G | М | 16    |
| 82  | 119 | Α | м | Α | F            | D            | R                        | Y | v | Α | 16    |
| 83  | 144 | Т | ĸ | Ι | G            | v            | A                        | Α | v | v | 16    |
| 84  | 147 | G | v | A | A            | v            | v                        | R | G | Α | 16    |
| 85  | 186 | V | M | K | L            | Α            | c                        | D | D | I | 16    |
| 86  | 230 | L | T | R | E            | Α            | Q                        | Α | K | A | 16    |
| 87  | 238 | Α | F | G | $\mathbf{T}$ | C            | V                        | s | Н | v | 16    |
| 88  | 249 | V | F | I | F            | Y            | $\underline{v}$          | P | F | r | 16    |
| 89  | 302 | Q | R | I | L            | R            | $\overline{\mathbf{L}}$  | F | Н | v | 16    |
| 90  | 303 | R | I | L | R            | L            | $\underline{\mathbf{F}}$ | Н | ٧ | A | 16    |
| 91  | 18  | G | L | P | G            | $\mathbf{L}$ | $\underline{\mathbf{E}}$ | E | A | Q | 15    |
| 92  | 35  | S | L | Y | L            | Ι            | A                        | V | L | G | 15    |
| 93  | 42  | L | G | N | L            | T            | I                        | Ι | Y | I | 15    |
| 94  | 46  | Т | I | I | Y            | I            | $\overline{\Lambda}$     | R | T | Е | 15    |
| 95  | 69  | S | G | I | D            | I            | ഥ                        | Ι | S | T | 15    |
| 96  | 76  | S | T | S | S            | M            | P                        | K | M | L | 15    |
| 97  | 131 | P | L | R | Н            | A            | $\underline{\mathbf{T}}$ | V | L | T | 15    |
| 98  | 137 | V | L | T | L            | P            | $\underline{\mathtt{R}}$ | V | T | K | 15    |
| 99  | 153 | R | G | A | A            | L            | $\underline{M}$          | A | P | L | 15    |
| 100 | 190 | Α | C | D | D            | Ι            | $\underline{\mathbf{R}}$ | V | N | V | 15    |
| 101 | 191 | С | D | D | Ι            | R            | V                        | N | V | V | 15    |
| 102 | 204 | V | I | Ι | S            | A            | Ī                        | G | L | D | 15    |
| 103 | 241 | Т | C | V | S            | Н            | $\overline{\Lambda}$     | C | A | V | 15    |
| 104 | 251 | I | F | Y | V            | P            | $\underline{F}$          | Ι | G | L | 15    |
| 105 | 269 | R | D | S | P            | L            | <u>P</u>                 | V | Ι | L | 15    |
| 106 | 280 | I | Y | L | L            | V            | <u>P</u>                 | Þ | V | L | 15    |
| 107 | 306 | R | L | F | H            | V            | <u>A</u>                 | Т | Н | A | 15    |

### HLA A\*0203 nonomers (SEQ ID NOS 1570-1594, respectively in order of appearance)

|    | Pos | 1 | 2                        | 3 | 4 | 5 | 6 | 7                        | 8 | 9 | score |
|----|-----|---|--------------------------|---|---|---|---|--------------------------|---|---|-------|
| 1  | 148 | V | A                        | A | V | V | R | G                        | Α | A | 14    |
| 2  | 119 | Α | M                        | A | F | D | R | Y                        | V | A | 13    |
| 3  | 147 | G | $\underline{v}$          | A | A | V | V | $\underline{R}$          | G | A | 12    |
| 4  | 97  | D | <u>A</u>                 | C | L | L | Q | Ī                        | F | A | 11    |
| 5  | 127 | Α | $\underline{\mathbf{I}}$ | C | Н | P | L | R                        | Н | A | 10    |
| 6  | 3   | D | P                        | N | G | N | E | <u>s</u>                 | s | A | 9     |
| 7  | 17  | I | $\underline{\mathbf{G}}$ | L | P | G | L | $\underline{\mathbf{E}}$ | E | A | 9     |
| 8  | 22  | L | E                        | E | A | Q | F | $\underline{W}$          | L | A | 9     |
| 9  | 32  | P | $\underline{\mathbf{L}}$ | С | S | L | Y | $\overline{\mathbf{r}}$  | I | A | 9     |
| 10 | 77  | T | <u>s</u>                 | S | М | P | K | $\underline{M}$          | L | A | 9     |
| 11 | 90  | N | $\underline{s}$          | T | T | I | Q | $\underline{\mathbf{F}}$ | D | A | 9     |
|    |     |   |                          |   |   |   |   |                          |   |   | 16    |

HLA A\*0203 nonomers (SEQ ID NOS 1570-1594, respectively in order of appearance)

|    | Pos | 1            | 2                        | 3 | 4 | 5 | 6 | 7                        | Я | 9 | score |
|----|-----|--------------|--------------------------|---|---|---|---|--------------------------|---|---|-------|
| 12 | 111 |              |                          |   |   |   |   | L                        |   |   | 9     |
| 13 | 113 | E            | s                        | T | v | L | L | A                        | М | A | 9     |
| 14 | 141 | P            | R                        | v | Т | K | I | G                        | V | A | 9     |
| 15 | 142 | R            | V                        | T | K | Ι | G | $\underline{v}$          | Α | A | 9     |
| 16 | 151 | V            | v                        | R | G | Α | Α | Ī                        | M | Α | 9     |
| 17 | 182 | $\mathbf{L}$ | H                        | Q | D | ٧ | М | K                        | L | A | 9     |
| 18 | 200 | Y            | $\underline{\mathbf{G}}$ | L | I | V | I | Ī                        | S | A | 9     |
| 19 | 226 | T            | v                        | L | G | L | T | R                        | E | A | 9     |
| 20 | 228 | L            | $\underline{\mathbf{G}}$ | L | T | R | E | A                        | Q | A | 9     |
| 21 | 230 | L            | $\underline{\mathbf{T}}$ | R | E | A | Q | A                        | K | A | 9     |
| 22 | 240 | G            | $\underline{\mathbf{T}}$ | C | ٧ | S | Н | $\overline{\Lambda}$     | С | A | 9     |
| 23 | 270 | D            | $\underline{s}$          | P | L | P | V | Ī                        | L | A | 9     |
| 24 | 303 | R            | Ī                        | L | R | L | F | H                        | V | A | 9     |
| 25 | 306 | R            | $\underline{\mathbf{r}}$ | F | H | V | A | $\underline{\mathbf{T}}$ | H | A | 9     |

### <u>H</u>LA-A26 nonomers(SEQ ID NOS 1595-1675, respectively in order of appearance)

|    | Pos | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9            | score |
|----|-----|--------------|---|---|---|---|---|---|---|--------------|-------|
| 1  | 299 | Е            | I | R | Q | R | Ι | L | R | L            | 30    |
| 2  | 72  | D            | Ι | L | Ι | s | Т | s | S | Μ            | 27    |
| 3  | 248 | Α            | V | F | Ι | F | Y | V | P | F            | 27    |
| 4  | 210 | G            | L | D | s | L | L | I | s | F            | .26   |
| 5  | 14  | F            | I | L | Ι | G | L | P | G | L            | 24    |
| 6  | 56  | S            | L | Н | E | P | М | Y | r | F            | 24    |
| 7  | 117 | L            | L | Α | М | Α | F | D | R | Y            | 24    |
| 8  | 222 | L            | I | L | K | T | V | L | G | L            | 24    |
| 9  | 245 | Н            | V | С | Α | ٧ | F | Ι | F | Y            | 24    |
| 10 | 11  | Α            | T | Y | F | I | L | I | G | L            | 23    |
| 11 | 37  | Y            | L | I | Α | V | L | G | N | L            | 23    |
| 12 | 114 | s            | T | V | L | L | A | М | A | F            | 23    |
| 13 | 156 | Α            | L | М | Α | P | L | P | V | F            | 23    |
| 14 | 162 | P            | V | F | I | K | Q | L | P | F            | 23    |
| 15 | 181 | C            | L | Н | Q | D | V | M | K | L            | 23    |
| 16 | 28  | W            | L | A | F | P | L | С | S | L            | 22    |
| 17 | 92  | $\mathbf{T}$ | T | Ι | Q | F | D | Α | C | $\mathbf{L}$ | 22    |
| 18 | 160 | P            | L | Ρ | V | F | I | K | Q | $\mathbf{L}$ | 22    |
| 19 | 203 | I            | V | Ι | Ι | s | Α | I | G | L            | 22    |
| 20 | 213 | S            | L | L | Ι | S | F | S | Y | L            | 22    |
| 21 | 275 | V            | Ι | L | Α | N | Ι | Y | L | L            | 22    |
| 22 | 193 | D            | I | R | V | N | V | V | Y | G            | 21    |
| 23 | 242 | С            | V | S | Н | V | C | A | V | F            | 21    |
| 24 | 76  | S            | T | s | S | M | P | K | М | L            | 20    |
| 25 | 253 | Ÿ            | V | P | F | Ι | G | L | S | M            | 20    |
| 26 | 274 | P            | V | I | L | Α | N | I | Y | L            | 20    |
| 27 | 23  | E            | E | А | Q | F | W | L | A | F            | 19    |
| 28 | 41  | V            | L | G | N | L | Т | I | I | Y            | 19    |
| 29 | 49  | Y            | I | V | R | Т | E | H | s | L            | 19    |
|    |     |              |   |   |   |   |   |   |   |              | 17    |

 $\underline{\underline{\text{HLA-A26}}}$  nonomers (SEQ ID NOS 1595-1675, respectively in order of appearance)

|    | Pos        | 1            | 2            | 3      | 4            | 5 | 6      | 7            | 8 | 9 | score |
|----|------------|--------------|--------------|--------|--------------|---|--------|--------------|---|---|-------|
| 30 | 150        | A            | V            | v      | R            | G | А      | A            | L | M | 19    |
| 31 | 150<br>174 | N            | ľ            |        | s            | Н | s      | Y            | С | L | 19    |
|    |            |              | D            | L      | R            | V | И      | v            | v | Y | 19    |
| 32 | 192        | D            |              |        |              |   |        |              |   |   |       |
| 33 | 214        | L            | L            | I      | S            | F | S      | Y            | L | L | 19    |
| 34 | 251        | I            | F            | Y      | V            | P | F      | I            | G | L | 19    |
| 35 | 8          | E            | S            | s      | A            | Т | Y      | F            | I | L | 18    |
| 36 | 21         | G            | Ь            | E      | E            | A | Q      | F            | W | L | 18    |
| 37 | 45         | L            | T            | I      | I            | Y | 1      | V            | R | Т | 18    |
| 38 | 54         | E            | Н            | S      | L            | Н | Ε      | P            | M | Y | 18    |
| 39 | 59         | E            | P            | M      | Y            | Ι | F      | L            | С | M | 18    |
| 40 | 88         | W            | F            | N      | S            | T | Т      | I            | Q | F | 18    |
| 41 | 93         | $\mathbf{T}$ | Ι            | Q      | F            | D | A      | С            | L | L | 18    |
| 42 | 185        | D            | V            | M      | K            | L | A      | С            | D | D | 18    |
| 43 | 198        | V            | V            | Y      | G            | L | Ι      | V            | Ι | I | 18    |
| 44 | 62         | Y            | Ι            | F      | $\mathbf{L}$ | C | M      | L            | S | G | 17    |
| 45 | 70         | G            | Ι            | D      | I            | L | I      | S            | T | s | 17    |
| 46 | 79         | S            | M            | P      | K            | М | Ļ      | Α            | Ι | F | 17    |
| 47 | 96         | F            | D            | A      | С            | L | L      | Q            | I | F | 17    |
| 48 | 104        | F            | Α            | I      | Н            | S | L      | S            | G | М | 17    |
| 49 | 138        | L            | Т            | L      | P            | R | V      | $\mathbf{T}$ | K | Ι | 17    |
| 50 | 143        | V            | $\mathbf{T}$ | K      | 1            | G | ٧      | Α            | Α | v | 17    |
| 51 | 204        | v            | I            | I      | s            | Α | Ι      | G            | L | D | 17    |
| 52 | 212        | D            | s            | L      | L            | I | S      | F            | S | Y | 17    |
| 53 | 220        | Y            | L            | L      | I            | L | K      | Т            | V | L | 17    |
| 54 | 256        | F            | I            | G      | L            | s | M      | v            | Н | R | 17    |
| 55 | 283        | L            | v            | P      | P            | V | L      | N            | Р | I | 17    |
| 56 | 29         | L            | Α            | F      | P            | L | С      | s            | L | Y | 16    |
| 57 | 40         | Α            | v            | L      | G            | N | L      | Т            | I | I | 16    |
| 58 | 46         | Т            | I            | I      | Y            | I | V      | R            | Т | Е | 16    |
| 59 | 52         | R            | т            | Е      | Н            | s | L      | Н            | Е | P | 16    |
| 60 | 75         | Ι            | s            | Т      | s            | s | М      | P            | к | М | 16    |
| 61 | 91         | S            | Т            | Т      | I            | 0 | F      | D            | A | С | 16    |
| 62 | 135        | Α            | т            | v      | L            | Т | L      | P            | R | v | 16    |
| 63 | 147        | G            | v            | Α      | Α            | V | V      | R            | G | Α | 16    |
| 64 | 201        | G            | L            | Ι      | v            | I | Ι      | s            | A | I | 16    |
| 65 | 257        | I            | G            | L      | s            | М | v      | Н            | R | F | 16    |
| 66 | 279        | N            | I            | Y      | L            | L | V      | P            | P | V | 16    |
| 67 | 30         | A            | F            | P      | L            | C | s      | L            | Y | L | 15    |
| 68 | 101        | L            | Q            | Ι      | F            | Ā | Ι      | Н            | s | L | 15    |
| 69 | 115        | T            | v            | L      |              | Α | М      | A            | F | D | 15    |
| 70 | 127        | A            | I            | C      | Н            | P | L      | R            | Н | A | 15    |
| 71 | 153        | R            | G            | A      | A            | L | М      | A            | P | L | 15    |
| 72 | 163        | v            | F            | I      | ĸ            | Q | L      | P            | F | c | 15    |
| 73 | 215        | L            | I            | s      | F            | s | Y      | L            | L | I | 15    |
| 74 | 215        | I            | S            | F      | s            | Y | L      | L            | I | L | 15    |
| 75 | 225        | K            | T            | V      | L            | G | L      | т            | R | E | 15    |
| 76 |            | P            | L            | P      | V            | I | L      | A            | N | I | 15    |
| 76 | 272<br>282 | L            | L            | V      | P            | P | A<br>P | L            | N | P | 15    |
|    |            | Ь            | Λ            | v<br>L |              |   | I      | V            | Y |   | 15    |
| 78 | 286        | Р            | ٧            | ч      | N            | P | 1      | V            | 1 | G | 18    |
|    |            |              |              |        |              |   |        |              |   |   | 10    |

 $\overline{\text{HLA-A26}}$  nonomers (SEQ ID NOS 1595-1675, respectively in order of appearance)

|     | Pos | 1 | 2 | 3  | 4 | 5  | 6 | 7  | 8  | 9  | score |
|-----|-----|---|---|----|---|----|---|----|----|----|-------|
| 79  | 287 | V | L | N  | P | Ι  | V | Y  | G  | v  | 15    |
| 80  | 296 | K | Т | K  | E | I  | R | Q  | R  | Ι  | 15    |
| 0.1 | 202 | ъ | т | Ť. | D | Τ. | c | LI | 17 | 7\ | 1 5   |

### HLA-A3 nonomers(SEQ ID NOS 1676-1747, respectively in order of appearance)

|    | Pos | 1 | 2 | 3                           | 4            | 5 | 6                           | 7                               | 8 | 9      | score |
|----|-----|---|---|-----------------------------|--------------|---|-----------------------------|---------------------------------|---|--------|-------|
| 1  | 137 | v | L | Т                           | L            | P | R                           | v                               | Т | ĸ      | 30    |
| 2  | 229 | G | L | T                           | R            | Ε | A                           | Q                               | A | ĸ      | 27    |
| 3  | 145 | K | I | G                           | v            | Α | A                           | v                               | ٧ | R      | 26    |
| 4  | 150 | Α | v | v                           | R            | G | A                           | A                               | L | M      | 24    |
| 5  | 290 | P | I | V                           | Y            | G | V                           | K                               | Т | ĸ      | 24    |
| 6  | 35  | S | L | Y                           | L            | Ι | A                           | v                               | L | G      | 23    |
| 7  | 156 | Α | L | M                           | A            | P | L                           | P                               | v | F      | 23    |
| 8  | 47  | I | I | Y                           | Ι            | V | R                           | T                               | Ε | H      | 22    |
| 9  | 50  | I | v | $\underline{\mathbf{R}}$    | $\mathbf{T}$ | E | H                           | $\underline{s}$                 | L | H      | 22    |
| 10 | 142 | R | v | $\underline{\mathbf{T}}$    | K            | I | G                           | $\overline{\Lambda}$            | A | A      | 22    |
| 11 | 151 | V | v | <u>R</u>                    | G            | Α | A                           | $\overline{\Gamma}$             | M | A      | 22    |
| 12 | 242 | C | v | $\underline{\mathbf{s}}$    | Н            | V | $\underline{\mathbf{c}}$    | A                               | V | F      | 22    |
| 13 | 248 | Α | v | $\underline{F}$             | I            | F | $\underline{\underline{Y}}$ | $\underline{v}$                 | P | F      | 22    |
| 14 | 116 | V | L | $\overline{\mathbf{r}}$     | A            | M | <u>A</u>                    | F                               | D | R      | 21    |
| 15 | 192 | D | D | Ī                           | R            | V | $\underline{N}$             | $\underline{\mathtt{v}}$        | V | Y      | 21    |
| 16 | 303 | R | I | $\underline{\mathbf{L}}$    | R            | L | $\underline{\mathbf{F}}$    | $\underline{\mathbf{H}}$        | V | A      | 21    |
| 17 | 304 | I | L | $\underline{\underline{R}}$ | L            | F | $\overline{\mathbf{H}}$     | $\underline{\mathtt{v}}$        | A | T      | 21    |
| 18 | 108 | S | L | <u>s</u>                    | G            | M | $\underline{\mathbf{E}}$    | <u>s</u>                        | T | V      | 20    |
| 19 | 198 | V | v | $\underline{\underline{Y}}$ | G            | L | Ī                           | $\underline{v}$                 | Ι | I      | 20    |
| 20 | 291 | I | V | <u>Y</u>                    | G            | V | <u>K</u>                    | $\underline{\mathbf{T}}$        | K | E      | 20    |
| 21 | 15  | I | L | Ī                           | G            | L | $\overline{\mathbf{b}}$     | $\underline{G}$                 | L | Ε      | 19    |
| 22 | 44  | N | L | T                           | Ι            | Ι | Y                           | Ī                               | V | R      | 19    |
| 23 | 73  | Ι | L | Ī                           | S            | Т | <u>s</u>                    | <u>s</u>                        | M | P      | 19    |
| 24 | 74  | L | I | $\underline{s}$             | Т            | S | <u>s</u>                    | $\underline{\underline{M}}$     | P | K      | 19    |
| 25 | 99  | С | L | $\overline{\Gamma}$         | Q            | Ι | $\underline{\mathbf{F}}$    | <u>A</u>                        | Ι | H      | 19    |
| 26 | 162 | P | V | $\underline{\mathbf{F}}$    | Ι            | K | Q                           | $\overline{\mathbf{r}}$         | P | F      | 19    |
| 27 | 203 | 1 | v | Ī                           | 1            | S | <u>A</u>                    | ī                               | G | L      | 19    |
| 28 | 221 | L | L | Ī                           | L            | K | <u>T</u>                    | <u>v</u>                        | L | G      | 19    |
| 29 | 245 | H | v | <u>C</u>                    | A            | V | F                           | Ī                               | F | Y      | 19    |
| 30 | 306 | R | L | <u>F</u>                    | H            | V | <u>A</u>                    | $\frac{\mathbf{T}}{}$           | Н | A      | 19    |
| 31 | 40  | A | V | Ī                           | G            | N | ī                           | $\frac{\mathbf{T}}{}$           | Ι | I      | 18    |
| 32 | 85  | Α | I | F                           | W            | F | N                           | <u>s</u>                        | Т | T      | 18    |
| 33 | 205 | 1 | I | <u>s</u>                    | A            | Ι | $\underline{G}$             | $\overline{\Gamma}$             | D | S      | 18    |
| 34 | 220 | Y | L | $\overline{\mathbf{r}}$     | Ι            | Г | K                           | $\frac{\mathbf{T}}{\mathbf{T}}$ | V | L      | 18    |
| 35 | 253 | Y | v | <u>P</u>                    | F            | Ι | G                           | Ī                               | S | M      | 18    |
| 36 | 37  | Y | L | Ī                           | A            | V | $\overline{\Gamma}$         | G                               | И | L      | 17    |
| 37 | 41  | V | L | <u>G</u>                    | N            | L | <u>T</u>                    | Ī                               | Ι | Y      | 17    |
| 38 | 117 | L | L | <u>A</u>                    | М            | A | F                           | D                               | R | Y      | 17    |
| 39 | 131 | P | L | R                           | Н            | A | T                           | Ā                               | L | T<br>_ | 17    |
| 40 | 136 | T | V | $\overline{\Gamma}$         | Т            | L | P                           | <u>R</u>                        | V | T      | 17    |
|    |     |   |   |                             |              |   |                             |                                 |   |        | 19    |

HLA-A3 nonomers(SEQ ID NOS 1676-1747, respectively in order of appearance)

|    | Pos | 1 | 2 | 3                                    | 4 | 5 | 6                                    | 7                        | 8 | 9 | score |
|----|-----|---|---|--------------------------------------|---|---|--------------------------------------|--------------------------|---|---|-------|
| 41 | 180 | Y | C | L                                    | Н | Q | D                                    | v                        | М | ĸ | 17    |
| 42 | 201 | G | L | I                                    | v | I | I                                    | s                        | Α | I | 17    |
| 43 | 213 | s | L | L                                    | I | s | F                                    | s                        | Y | L | 17    |
| 44 | 256 | F | I | G                                    | L | s | M                                    | v                        | Н | R | 17    |
| 45 | 261 | М | v | H                                    | R | F | s                                    | K                        | R | R | 17    |
| 46 | 276 | I | L | A                                    | N | I | Y                                    | L                        | L | v | 17    |
| 47 | 281 | Y | L | L                                    | V | P | P                                    | v                        | L | N | 17    |
| 48 | 286 | P | v | L                                    | N | P | Ī                                    | v                        | Y | G | 17    |
| 49 | 288 | L | N | P                                    | Ι | V | Y                                    | G                        | ν | ĸ | 17    |
| 50 | 309 | Н | v | Α                                    | T | Н | A                                    | <u>s</u>                 | Ε | P | 17    |
| 51 | 1   | М | v | ₫                                    | P | N | G                                    | N                        | E | s | 16    |
| 52 | 56  | s | L | H                                    | E | p | $\underline{M}$                      | <u>Y</u>                 | 1 | F | 16    |
| 53 | 70  | G | I | $\underline{\mathtt{D}}$             | Ι | L | $\underline{\mathbf{I}}$             | $\underline{s}$          | T | S | 16    |
| 54 | 72  | D | I | $\underline{\mathbf{L}}$             | Ι | S | $\underline{\underline{\mathtt{T}}}$ | $\underline{s}$          | S | M | 16    |
| 55 | 115 | T | v | $\overline{\Gamma}$                  | L | Α | $\underline{\underline{M}}$          | A                        | F | D | 16    |
| 56 | 125 | Y | V | A                                    | Ι | C | $\underline{\mathbf{H}}$             | <u>P</u>                 | L | R | 16    |
| 57 | 144 | Т | K | <u>I</u>                             | G | V | A                                    | A                        | V | v | 16    |
| 58 | 167 | Q | L | $\underline{\mathbf{p}}$             | F | С | $\underline{\mathbf{R}}$             | <u>s</u>                 | N | I | 16    |
| 59 | 175 | I | L | <u>s</u>                             | Н | S | $\underline{\underline{Y}}$          | $\underline{c}$          | L | H | 16    |
| 60 | 195 | R | v | $\overline{N}$                       | V | V | $\underline{\underline{Y}}$          | $\underline{\mathbf{G}}$ | L | I | 16    |
| 61 | 197 | N | v | $\underline{v}$                      | Y | G | $\overline{\mathbf{L}}$              | Ī                        | V | I | 16    |
| 62 | 210 | G | L | $\overline{\mathbf{D}}$              | S | L | $\underline{\mathbf{L}}$             | Ī                        | S | F | 16    |
| 63 | 282 | L | L | $\overline{\Lambda}$                 | P | P | Ā                                    | $\overline{\Gamma}$      | И | P | 16    |
| 64 | 299 | Е | Ι | R                                    | Q | R | I                                    | $\overline{\mathbf{r}}$  | R | L | 16    |
| 65 | 301 | R | Q | $\underline{R}$                      | Ι | L | $\underline{\mathbf{R}}$             | $\overline{\mathbf{r}}$  | F | H | 16    |
| 66 | 16  | L | I | $\underline{G}$                      | L | Þ | G                                    | $\overline{\Gamma}$      | Ε | E | 15    |
| 67 | 46  | Т | I | $\underline{\underline{\mathtt{I}}}$ | Y | Ι | $\overline{\Lambda}$                 | <u>R</u>                 | T | Ε | 15    |
| 68 | 102 | Q | I | $\underline{F}$                      | A | Ι | <u>H</u>                             | $\frac{S}{2}$            | L | s | 15    |
| 69 | 193 | D | Ι | <u>R</u>                             | V | N | $\overline{\Lambda}$                 | <u>v</u>                 | Y | G | 15    |
| 70 | 208 | A | I | $\underline{G}$                      | L | D | $\underline{\mathbf{s}}$             | $\overline{\mathbf{r}}$  | L | I | 15    |
| 71 | 223 | Ι | L | <u>K</u>                             | Т | V | $\overline{\mathbf{r}}$              | $\underline{G}$          | L | Т | 15    |
| 72 | 237 | K | A | F                                    | G | T | $\underline{C}$                      | v                        | S | H | 15    |

### HLA-B\*0702 nonomers(SEQ ID NOS 1748-1812, respectively in order of appearance)

|    | Pos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | score |
|----|-----|---|---|---|---|---|---|---|---|---|-------|
| 1  | 130 | Н | P | L | R | Н | Α | Т | v | L | 22    |
| 2  | 59  | E | P | М | Y | Ι | F | L | С | M | 21    |
| 3  | 168 | L | P | F | C | R | s | N | I | L | 20    |
| 4  | 289 | N | P | I | V | Y | G | V | K | T | 19    |
| 5  | 3   | D | P | N | G | N | E | S | S | A | 18    |
| 6  | 19  | L | P | G | L | E | E | Α | Q | F | 18    |
| 7  | 140 | L | P | R | V | T | K | 1 | G | v | 18    |
| 8  | 284 | V | P | P | V | L | N | Р | I | v | 17    |
| 9  | 31  | F | P | L | С | S | L | Y | L | I | 16    |
| 10 | 254 | V | P | F | Ι | G | L | S | M | v | 16    |
| 11 | 269 | R | D | s | P | L | P | V | Ι | L | 16    |
|    |     |   |   |   |   |   |   |   |   |   | 20    |

HLA-B\*0702 nonomers(SEQ ID NOS 1748-1812, respectively in order of appearance)

|    |     |        |   | - | -  |        |        |        |        |        |          |
|----|-----|--------|---|---|----|--------|--------|--------|--------|--------|----------|
|    | Pos | 1      | 2 | 3 | 4  | 5      | 6      | 7      | 8      | 9      | score    |
| 12 | 149 | A      | A | v | V  | R      | G      | A      | A      | L      | 15       |
| 13 | 153 | R      | G | A | A  | L      | М      | A      | P      | L      | 15       |
| 14 | 156 | A      | L | М | A  | Р      | L      | P      | V      | F      | 15       |
| 15 | 251 | I      | F | Y | v  | P      | F      | I      | G      | L      | 15       |
| 16 | 299 | E      | I | R | Q  | R      | I      | L      | R      | L      | 15       |
| 17 | 8   | E      | s | s | A  | Т      | Y      | F      | I      | L      | 14       |
| 18 | 28  | W      | L | A | F  | P      | L      | C      | s      | L      | 14       |
| 19 | 30  | A      | F | P | L  | C      | s      | L      | Y      | L      | 14       |
| 20 | 110 | s      | G | М | E  | s      | Т      | v      | L      | L      | 14       |
| 21 | 132 | L      | R | Н | A  | Т      | V      | L      | Т      | L      | 14       |
| 22 | 159 | A      | P | L | P  | v      | F      | I      | ĸ      | Q      | 14       |
| 23 | 222 | L      | I | L | K  | Т      | V      | L      | G      | L      | 14       |
| 24 | 271 | S      | P | L | P  | v      | I      | L      | A      | N      | 14       |
| 25 | 25  | A      | Q | F | W  | v<br>L | A      | F      | P      | L      | 13       |
| 26 | 109 | L      | S | G | M  | E      | s      | Т      | V      | L      | 13       |
| 27 | 124 | R      | Y | V | A  | I      | C      | Н      | P      | L      | 13       |
| 28 | 216 | I      | s | F | S  | Y      | L      | L      | I      | L      | 13       |
| 29 | 268 | R      | R | D | S  | P      | Ь      | Þ      | V      | ı      |          |
| 30 | 280 | I      | Y | L | L  | V      | Р      | P      | v      | L      | 13<br>13 |
| 31 | 11  | A      | Т | У | F  | I      | L      | I      | v<br>G | L      | 12       |
| 32 | 34  | C      | s | L | Y  | ь      | I      | A      | V      | L      | 12       |
| 33 | 57  | L      | Н | Е | Р  | М      | Y      | I      | F      | L      |          |
| 34 | 76  | S      | Т | S | S  | M      | P      | K      |        |        | 12       |
| 35 | 142 |        | v | T | K  | I      | G      |        | M<br>A | L      | 12       |
| 36 | 151 | R<br>V | v | R | G  | A      | A      | V<br>L | M      | A<br>A | 12       |
| 37 | 190 | v<br>A | C | D | D  | I      | R      | А      | N      | v      | 12       |
| 38 | 194 | I      | R | V | N  | V      |        |        |        |        | 12       |
| 39 | 206 | I      | S | A | I  | v<br>G | V<br>L | Y<br>D | G<br>S | L      | 12       |
| 40 | 207 | S      | A | I | G  | L      | D      | s      | L      | L      | 12<br>12 |
| 41 | 220 | Y      | L | L | I  | ь      | К      | Т      | Λ<br>Γ | L      | 12       |
| 42 | 267 | K      | R | R | D  | S      | P      | L      | P      | Λ.     | 12       |
| 43 | 304 | I      | L | R | L  | F      | Н      | V      | A      | T      | 12       |
| 44 | 14  | F      | I | L | Ι  | G      | L      | P      | G      | L      | 11       |
| 45 | 23  | E      | E | А | Q  | F      | W      | L      | A      | F      | 11       |
| 46 | 37  | Y      | L | I | A  | V      | L      | G      | N      | L      | 11       |
| 47 | 40  | A      | v | L | G  | N      | L      | Т      | I      | I      | 11       |
| 48 | 77  | Т      | s | S | М  | P      | K      | М      | L      | A      | 11       |
| 49 | 78  | s      | s | M | P  | K      | M      | L      | A      | I      | 11       |
| 50 | 80  | М      | P | ĸ | М  | L      | A      | I      | F      | W      | 11       |
| 51 | 92  | Т      | T | I | Q  | F      |        |        | C      | L      | 11       |
| 52 | 112 | М      | E | s | T  | v      | L      | L      | A      | м      | 11       |
| 53 | 119 | A      | м | A | F  | D      | R      | Y      | V      | A      | 11       |
| 54 | 127 | A      | I | C | Н  | P      | L      | R      | Н      | A      | 11       |
| 55 | 131 | P      | L | R | Н  | A      | Т      | V      | L      | T      | 11       |
| 56 | 155 | A      | A | L | M  | Α      | P      | L      | Ъ      | v      | 11       |
| 57 | 157 | L      | M | А | P  | L      | P      | V      | F      | ĭ      | 11       |
| 58 | 181 | С      | L | Н | Q  | D      | V      | M      | K      | L      | 11       |
| 59 | 203 | I      | v | I | I  | s      | A      | I      | G      | L      | 11       |
| 60 | 203 | A      | ĭ | G | L  | D      | S      | L      | L      | I      | 11       |
| 00 | 200 | А      | - | J | יי | ט      | J      | ш      | ш      | _      | 21       |
|    |     |        |   |   |    |        |        |        |        |        | ۷1       |

### HLA-B\*0702 nonomers(SEQ ID NOS 1748-1812, respectively in order of appearance)

|    | Pos |   |   |   |   |   |   |   |              |   | score |
|----|-----|---|---|---|---|---|---|---|--------------|---|-------|
|    | 105 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8            | 9 | BCOLE |
| 61 | 213 | S | L | L | Ι | S | F | S | Y            | L | 11    |
| 62 | 248 | Α | v | F | I | F | Y | V | P            | F | 11    |
| 63 | 265 | F | S | K | R | R | D | s | P            | L | 11    |
| 64 | 275 | V | I | L | Α | N | I | Y | $\mathbf{L}$ | L | 11    |
| 65 | 285 | Р | P | ν | L | N | Р | Ι | V            | Y | 1.1   |

#### HLA-B\*08 nonomers(SEQ ID NOS 1813-1847, respectively in order of appearance)

|    | Pos | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8            | 9 | score |
|----|-----|--------------|---|---|---|---|---|---|--------------|---|-------|
| 1  | 299 | E            | I | R | 0 | R | I | Ĺ | R            | L | 31    |
| 2  | 265 | F            | s | ĸ | R | R | D | s | P            | L | 29    |
| 3  | 149 | A            | A | v | v | R | G | A | A            | L | 24    |
| 4  | 168 | L            | P | F | C | R | s | N | I            | L | 24    |
| 5  | 294 | G            | v | ĸ | Т | ĸ | E | I | R            | Q | 21    |
| 6  | 120 | М            | A | F | D | R | Y | v | A            | ĭ | 20    |
| 7  | 292 | v            | Y | G | v | K | Т | ĸ | E            | I | 20    |
| 8  | 21  | G            | L | E | E | A | Q | F | W            | L | 19    |
| 9  | 78  | s            | s | M | P | ĸ | M | L | A            | I | 19    |
| 10 | 160 | P            | L | P | v | F | I | K | 0            | L | 19    |
| 11 | 186 | V            | М | ĸ | L | A | C | D | D            | ľ | 18    |
| 12 | 213 | S            | L | L | I | s | F | s | Y            | L | 18    |
| 13 | 221 | L            | L | I | L | ĸ | т | v | L            | G | 18    |
| 14 | 296 | K            | Т | ĸ | Е | I | R | Q | R            | I | 18    |
| 15 | 297 | $\mathbf{T}$ | K | E | I | R | 0 | R | Ι            | L | 18    |
| 16 | 130 | Н            | P | L | R | н | A | Т | v            | L | 17    |
| 17 | 181 | С            | L | н | Q | D | v | М | К            | L | 17    |
| 18 | 223 | I            | L | ĸ | Т | v | L | G | L            | т | 17    |
| 19 | 28  | W            | L | A | F | P | L | С | s            | L | 16    |
| 20 | 37  | Y            | L | I | Α | v | L | G | N            | L | 16    |
| 21 | 56  | s            | L | н | Е | P | М | Y | Ι            | F | 16    |
| 22 | 80  | M            | P | ĸ | М | L | Α | 1 | F            | W | 16    |
| 23 | 162 | P            | V | F | I | K | Q | L | P            | F | 16    |
| 24 | 201 | G            | L | I | V | I | I | s | Α            | I | 16    |
| 25 | 207 | S            | A | I | G | L | D | s | L            | L | 16    |
| 26 | 214 | L            | L | I | s | F | S | Y | $\mathbf{L}$ | L | 16    |
| 27 | 220 | Y            | L | L | Ι | L | K | Т | V            | L | 16    |
| 28 | 233 | E            | Α | Q | Α | ĸ | A | F | G            | T | 16    |
| 29 | 275 | V            | 1 | L | A | N | I | Y | L            | L | 16    |
| 30 | 304 | I            | L | R | L | F | Н | V | Α            | T | 16    |
| 31 | 14  | F            | I | L | I | G | L | P | G            | L | 15    |
| 32 | 110 | S            | G | M | E | s | Т | V | L            | L | 15    |
| 33 | 138 | L            | T | L | P | R | V | Т | K            | I | 15    |
| 34 | 164 | F            | I | K | Q | L | P | F | С            | R | 15    |
| 35 | 222 | L            | I | L | K | T | V | L | G            | L | 15    |
|    |     |              |   |   |   |   |   |   |              |   |       |

HLA-B\*1510 nonomers(SEQ ID NOS 1848-1890, respectively in order of appearance)

|    | Pos | 1            | 2 | 3 | 4 | 5            | 6            | 7 | 8            | 9 | score |
|----|-----|--------------|---|---|---|--------------|--------------|---|--------------|---|-------|
| 1  | 57  | L            | Н | E | P | М            | Y            | Ī | F            | L | 23    |
| 2  | 244 | s            | н | v | C | Α            | V            | F | I            | F | 17    |
| 3  | 269 | R            | D | s | P | L            | P            | v | ī            | L | 16    |
| 4  | 280 | I            | Y | L | L | v            | P            | P | ٧            | L | 16    |
| 5  | 262 | v            | н | R | F | s            | K            | R | R            | D | 15    |
| 6  | 299 | Ē            | I | R | 0 | R            | I            | L | R            | L | 15    |
| 7  | 106 | ī            | н | s | L | s            | G            | М | Ε            | s | 14    |
| 8  | 206 | I            | s | A | I | G            | L            | D | s            | L | 14    |
| 9  | 220 | Y            | L | L | ī | L            | K            | Т | V            | L | 14    |
| 10 | 251 | I            | F | Y | v | P            | F            | I | Ġ            | L | 14    |
| 11 | 297 | Т            | K | Ε | I | R            | Q            | R | Ι            | L | 14    |
| 12 | 21  | G            | L | Е | Ε | Α            | Q            | F | W            | L | 13    |
| 13 | 34  | С            | s | L | Y | L            | I            | Α | v            | L | 13    |
| 14 | 54  | Е            | н | S | L | Н            | Е            | P | M            | Y | 13    |
| 15 | 110 | s            | G | М | Е | S            | T            | V | L            | L | 13    |
| 16 | 194 | I            | R | v | N | V            | v            | Y | G            | L | 13    |
| 17 | 8   | E            | s | s | Α | Т            | Y            | F | I            | L | 12    |
| 18 | 14  | F            | I | L | Ι | G            | L            | P | G            | L | 12    |
| 19 | 28  | M            | L | A | F | Р            | L            | С | s            | L | 12    |
| 20 | 66  | C            | M | L | s | G            | I            | D | I            | L | 12    |
| 21 | 76  | s            | T | s | s | М            | P            | K | М            | L | 12    |
| 22 | 92  | T            | T | Ι | Q | F            | D            | Α | C            | L | 12    |
| 23 | 109 | L            | s | G | М | E            | S            | Т | v            | L | 12    |
| 24 | 130 | Н            | P | L | R | Н            | Α            | T | V            | L | 12    |
| 25 | 132 | L            | R | Н | Α | $\mathbf{T}$ | V            | L | $\mathbf{T}$ | L | 12    |
| 26 | 149 | Α            | A | V | V | R            | G            | A | Α            | L | 12    |
| 27 | 153 | R            | G | A | Α | L            | M            | Α | P            | L | 12    |
| 28 | 160 | P            | L | P | V | F            | I            | K | Q            | L | 12    |
| 29 | 181 | C            | L | Н | Q | D            | V            | Μ | K            | L | 12    |
| 30 | 182 | L            | H | Q | D | V            | М            | K | L            | A | 12    |
| 31 | 203 | I            | V | I | Ι | S            | A            | Ι | G            | L | 12    |
| 32 | 216 | I            | s | F | S | Y            | $\mathbf{L}$ | L | I            | L | 12    |
| 33 | 222 | L            | I | L | K | T            | V            | L | G            | L | 12    |
| 34 | 275 | V            | I | L | A | N            | Ι            | Y | L            | L | 12    |
| 35 | 37  | Y            | L | I | A | V            | L            | G | N            | L | 11    |
| 36 | 49  | Y            | Ι | ٧ | R | Т            | E            | Н | S            | L | 11    |
| 37 | 93  | $\mathbf{T}$ | I | Q | F | D            | A            | C | L            | L | 11    |
| 38 | 101 | L            | Q | Ι | F | A            | Ι            | Н | S            | L | 11    |
| 39 | 129 | C            | H | Р | L | R            | Η            | A | Т            | V | 11    |
| 40 | 133 | R            | H | A | Т | V            | L            | Т | L            | P | 11    |
| 41 | 177 | S            | Н | S | Y | С            | L            | Н | Q            | D | 11    |
| 42 | 207 | S            | A | Ι | G | L            | D            | S | L            | L | 11    |
| 43 | 257 | I            | G | L | S | М            | V            | Н | R            | F | 11    |

HLA-B\*2705 nonomers (SEQ ID NOS 1891-2008, respectively in order of appearance)

HLA-B\*2705 nonomers(SEQ ID NOS 1891-2008, respectively in order of appearance)

|    | Pos |   |   |   |   |   |   |   |   |   | score |
|----|-----|---|---|---|---|---|---|---|---|---|-------|
| _  |     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |       |
| 1  | 194 | I | R | V | N | V | V | Y | G | L | 25    |
| 2  | 268 | R | R | D | s | P | L | P | V | I | 24    |
| 3  | 132 | L | R | Н | A | T | V | L | T | L | 23    |
| 4  | 300 | I | R | Q | R | Ι | L | R | L | F | 23    |
| 5  | 305 | L | R | L | F | Н | V | A | Т | H | 23    |
| 6  | 231 | Т | R | E | Α | Q | A | K | A | F | 21    |
| 7  | 34  | C | S | L | Y | L | Ι | A | V | L | 18    |
| 8  | 299 | E | Ι | R | Q | R | Ι | L | R | L | 18    |
| 9  | 6   | G | N | Ε | s | S | A | T | Y | F | 17    |
| 10 | 66  | C | M | L | S | G | Ι | D | Ι | L | 17    |
| 11 | 162 | P | V | F | Ι | K | Q | L | P | F | 17    |
| 12 | 207 | S | Α | 1 | G | L | D | S | L | L | 17    |
| 13 | 210 | G | L | D | S | L | L | Ι | S | F | 17    |
| 14 | 220 | Y | L | L | I | L | K | Т | V | L | 17    |
| 15 | 237 | K | A | F | G | T | C | V | S | Н | 17    |
| 16 | 269 | R | D | S | Р | L | P | V | Ι | L | 17    |
| 17 | 280 | Ι | Y | L | L | V | P | P | V | Ļ | 17    |
| 18 | 295 | V | K | T | K | Ε | Ι | R | Q | R | 17    |
| 19 | 11  | A | Т | Y | F | Ι | L | Ι | G | L | 16    |
| 20 | 14  | F | I | L | I | G | L | Р | G | L | 16    |
| 21 | 21  | G | L | Ε | Ε | A | Q | F | W | L | 16    |
| 22 | 25  | A | Q | F | W | L | A | F | P | L | 16    |
| 23 | 37  | Y | L | 1 | A | V | L | G | N | L | 16    |
| 24 | 92  | T | T | Ι | Q | F | D | A | С | L | 16    |
| 25 | 101 | L | Q | Ι | F | A | Ι | H | S | L | 16    |
| 26 | 124 | R | Y | V | A | Ι | С | Н | Ρ | L | 16    |
| 27 | 130 | Н | P | L | R | Н | A | Т | V | L | 16    |
| 28 | 141 | P | R | V | T | K | Ι | G | V | A | 16    |
| 29 | 153 | R | G | A | A | L | M | Α | P | L | 16    |
| 30 | 181 | С | L | Н | Q | D | V | М | K | L | 16    |
| 31 | 201 | G | L | Ι | V | Ι | Ι | S | A | Ι | 16    |
| 32 | 203 | I | V | Ι | Ι | S | A | Ι | G | L | 16    |
| 33 | 216 | I | S | F | S | Y | L | L | Ι | L | 16    |
| 34 | 222 | L | I | L | K | Т | V | L | G | L | 16    |
| 35 | 255 | P | F | I | G | L | S | M | V | Н | 16    |
| 36 | 257 | I | G | L | S | M | V | Η | R | F | 16    |
| 37 | 275 | V | Ι | L | A | N | Ι | Y | L | L | 16    |
| 38 | 47  | Ι | Ι | Y | Ι | V | R | Т | E | Н | 15    |
| 39 | 109 | L | S | G | M | Ε | S | T | V | L | 15    |
| 40 | 114 | S | Т | V | L | L |   | M | A | F | 15    |
| 41 | 123 | D | R | Y | V | A | Ι | С | Н | P | 15    |
| 42 | 145 | K | I | G | V | A | A | V | V | R | 15    |
| 43 | 156 | A | L | M | A | P | L | Р | V | F | 15    |
| 44 | 168 | L | P | F | C | R | S | N | Ι | L | 15    |
| 45 | 172 | R | S | N | Ι | L | S | Н | s | Y | 15    |
| 46 | 198 | V | V | Y | G | L | 1 | V | Ι | I | 15    |
| 47 | 206 | Ι | S | A | Ι | G | L | D | S | L | 15    |
| 48 | 229 | G | L | Т | R | Ε | A | Q | A | K | 15    |
| 49 | 248 | A | ٧ | F | Ι | F | Y | V | P | F | 15    |
|    |     |   |   |   |   |   |   |   |   |   | 24    |

HLA-B\*2705 nonomers(SEQ ID NOS 1891-2008, respectively in order of appearance)

|    |     |   |   | _ | _ |   |              |              |   |   |       |
|----|-----|---|---|---|---|---|--------------|--------------|---|---|-------|
|    | Pos | 1 | 2 | 3 | 4 | 5 | 6            | 7            | 8 | 9 | score |
| 50 | 251 | I | F | Y | V | P | F            | Ι            | G | L | 15    |
| 51 | 274 | P | v | Ι | L | Α | N            | I            | Y | L | 15    |
| 52 | 290 | P | I | V | Y | G | V            | K            | Т | ĸ | 15    |
| 53 | 298 | K | E | I | R | Q | R            | I            | L | R | 15    |
| 54 | 19  | L | P | G | L | Е | Ε            | Α            | Q | F | 14    |
| 55 | 29  | L | A | F | P | L | С            | s            | L | Y | 14    |
| 56 | 30  | Α | F | P | L | С | S            | L            | Y | L | 14    |
| 57 | 39  | Ι | A | V | L | G | N            | L            | Т | I | 14    |
| 58 | 40  | Α | v | L | G | N | L            | Т            | Ι | I | 14    |
| 59 | 79  | S | M | P | K | М | L            | Α            | Ι | F | 14    |
| 60 | 81  | P | K | М | L | Α | 1            | $\mathbf{F}$ | W | F | 14    |
| 61 | 99  | С | L | Ь | Q | Ι | F            | Α            | Ι | H | 14    |
| 62 | 137 | V | L | Т | L | Р | R            | v            | T | K | 14    |
| 63 | 138 | L | T | L | P | R | ٧            | T            | K | I | 14    |
| 64 | 150 | Α | v | v | R | G | Α            | Α            | L | M | 14    |
| 65 | 160 | P | L | P | V | F | Ι            | K            | Q | L | 14    |
| 66 | 174 | N | I | L | s | Н | s            | Y            | С | L | 14    |
| 67 | 180 | Y | C | L | Н | Q | D            | v            | М | ĸ | 14    |
| 68 | 192 | D | D | Ι | R | V | N            | V            | V | Y | 14    |
| 69 | 212 | D | s | L | L | Ι | s            | F            | s | Y | 14    |
| 70 | 213 | s | L | L | Ι | s | F            | s            | Y | L | 14    |
| 71 | 214 | L | L | Ι | S | F | S            | Y            | L | L | 14    |
| 72 | 260 | s | M | V | Н | R | F            | s            | K | R | 14    |
| 73 | 263 | Н | R | F | s | K | R            | R            | D | s | 14    |
| 74 | 267 | K | R | R | D | S | P            | L            | P | v | 14    |
| 75 | 293 | Y | G | V | K | Т | K            | E            | I | R | 14    |
| 76 | 301 | R | Q | R | Ι | L | R            | $\mathbf{L}$ | F | н | 14    |
| 77 | 302 | Q | R | I | L | R | $\mathbf{L}$ | F            | Н | v | 14    |
| 78 | 5   | N | G | N | E | S | S            | Α            | Т | Y | 13    |
| 79 | 23  | E | E | A | Q | F | M            | L            | A | F | 13    |
| 80 | 28  | W | L | A | F | P | L            | С            | S | L | 13    |
| 81 | 44  | N | L | Т | Ι | Ι | Y            | Ι            | V | R | 13    |
| 82 | 51  | V | R | Т | Ε | Н | S            | L            | H | E | 13    |
| 83 | 56  | S | L | Н | Ε | P | M            | Y            | Ι | F | 13    |
| 84 | 60  | P | M | Y | Ι | F | L            | С            | M | L | 13    |
| 85 | 72  | D | Ι | L | Ι | S | Т            | S            | S | M | 13    |
| 86 | 74  | L | I | S | Т | S | S            | M            | P | K | 13    |
| 87 | 75  | Ι | S | T | S | S | M            | P            | K | M | 13    |
| 88 | 98  | Α | C | L | L | Q | Ι            | F            | A | Ι | 13    |
| 89 | 104 | F | A | Ι | Н | S | L            | S            | G | M | 13    |
| 90 | 110 | S | G | M | Ε | S | Т            | V            | L | L | 13    |
| 91 | 116 | V | L | L | A | M | A            | F            | D | R | 13    |
| 92 | 126 | V | A | Ι | С | Η | P            | L            | R | H | 13    |
| 93 | 149 | Α | A | V | V | R | G            | Α            | A | L | 13    |
| 94 | 158 | M | A | ₽ | L | P | V            | F            | Ι | K | 13    |
| 95 | 164 | F | I | K | Q | L | Р            | F            | С | R | 13    |
| 96 | 170 | F | С | R | s | N | Ι            | L            | S | H | 13    |
| 97 | 171 | С | R | S | N | Ι | $\mathbf{L}$ | S            | Н | S | 13    |
| 98 | 187 | М | K | L | A | C | D            | D            | Ι | R | 13    |
|    |     |   |   |   |   |   |              |              |   |   | 25    |

HLA-B\*2705 nonomers(SEQ ID NOS 1891-2008, respectively in order of appearance)

|     | Pos        |   |   |   |   |          |              |   |   |   | score |
|-----|------------|---|---|---|---|----------|--------------|---|---|---|-------|
|     |            | 1 | 2 | 3 | 4 | 5        | 6            | 7 | 8 | 9 | 50010 |
| 99  | 217        | S | F | S | Y | $\Gamma$ | $\mathbf{L}$ | Ι | L | K | 13    |
| 100 | 224        | L | ĸ | Т | V | L        | G            | L | Т | R | 13    |
| 101 | 242        | C | v | S | Н | V        | С            | Α | V | F | 13    |
| 102 | 256        | F | I | G | L | S        | M            | V | Н | R | 13    |
| 103 | 261        | M | v | Н | R | F        | s            | K | R | R | 13    |
| 104 | 49         | Y | I | V | R | Т        | E            | Н | S | L | 12    |
| 105 | 5 <b>7</b> | L | H | E | P | M        | Y            | Ι | F | L | 12    |
| 106 | 88         | W | F | N | S | Т        | Т            | I | Q | F | 12    |
| 107 | 96         | F | D | Α | C | L        | L            | Q | I | F | 12    |
| 108 | 134        | Н | A | Т | V | L        | $\mathbf{T}$ | L | P | R | 12    |
| 109 | 152        | V | R | G | Α | Α        | L            | М | Α | P | 12    |
| 110 | 179        | s | Y | C | L | Н        | Q            | D | V | M | 12    |
| 111 | 197        | N | v | V | Y | G        | L            | Ι | V | I | 12    |
| 112 | 244        | S | Н | V | С | A        | V            | F | I | F | 12    |
| 113 | 265        | F | s | K | R | R        | D            | S | P | L | 12    |
| 114 | 273        | L | P | V | I | L        | Α            | N | I | Y | 12    |
| 115 | 285        | P | P | V | L | N        | P            | Ι | V | Y | 12    |
| 116 | 288        | L | N | P | I | V        | Y            | G | V | ĸ | 12    |
| 117 | 296        | K | T | K | E | Ι        | R            | Q | R | I | 12    |
| 118 | 297        | Т | ĸ | E | 1 | R        | Q            | R | Ι | L | 12    |

# HLA-B\*2709 nonomers(SEQ ID NOS 2009-2063, respectively in order of appearance)

|    | Pos | 1            | 2            | 3 | 4 | 5            | 6 | 7 | 8 | 9 | score |
|----|-----|--------------|--------------|---|---|--------------|---|---|---|---|-------|
| 1  | 194 | I            | R            | V | _ |              |   |   | - | _ | 0.4   |
|    |     |              |              |   | N | V            | V |   | G | L | 24    |
| 2  | 268 | R            | R            | D | S | Р            | L | Р | V | I | 24    |
| 3  | 132 | L            | R            | Н | A | Т            | V | L | Т | L | 22    |
| 4  | 267 | K            | R            | R | D | S            | P | L | P | V | 21    |
| 5  | 300 | I            | R            | Q | R | I            | L | R | L | F | 20    |
| 6  | 231 | $\mathbf{T}$ | R            | Е | Α | Q            | Α | K | Α | F | 19    |
| 7  | 302 | Q            | R            | I | L | R            | L | F | Н | v | 19    |
| 8  | 124 | R            | Y            | V | Α | I            | С | Н | P | L | 16    |
| 9  | 269 | R            | D            | S | P | L            | P | V | I | L | 16    |
| 10 | 43  | G            | N            | L | Т | I            | I | Y | I | V | 15    |
| 11 | 216 | I            | S            | F | S | Y            | L | L | I | L | 15    |
| 12 | 11  | Α            | $\mathbf{T}$ | Y | F | Ι            | L | Ι | G | L | 14    |
| 13 | 25  | Α            | Q            | F | M | L            | A | F | P | L | 14    |
| 14 | 153 | R            | G            | A | A | L            | М | Α | P | L | 14    |
| 15 | 174 | N            | Ι            | L | S | Н            | s | Y | C | L | 14    |
| 16 | 222 | L            | 1            | L | K | $\mathbf{T}$ | V | L | G | L | 14    |
| 17 | 257 | I            | G            | L | s | М            | V | Н | R | F | 14    |
| 18 | 280 | I            | Y            | L | L | V            | P | P | v | L | 14    |
| 19 | 6   | G            | N            | E | S | S            | A | T | Y | F | 13    |
| 20 | 14  | F            | I            | L | I | G            | L | P | G | L | 13    |
| 21 | 21  | G            | L            | E | E | Α            | Q | F | W | L | 13    |
| 22 | 66  | C            | М            | L | S | G            | I | D | I | L | 13    |
|    |     |              |              |   |   |              |   |   |   |   | 26    |

HLA-B\*2709 nonomers(SEQ ID NOS 2009-2063, respectively in order of appearance)

|    | Pos | 1            | 2 | 3 | 4            | 5 | 6 | 7 | 8            | 9            | score |
|----|-----|--------------|---|---|--------------|---|---|---|--------------|--------------|-------|
| 23 | 130 | Н            | P | L | R            | Н | Α | Т | V            | L            | 13    |
| 24 | 201 | G            | L | I | v            | Ι | I | s | Α            | Ι            | 13    |
| 25 | 203 | I            | V | I | I            | S | Α | I | G            | L            | 13    |
| 26 | 214 | L            | L | Ι | s            | F | s | Y | L            | L            | 13    |
| 27 | 251 | I            | F | Y | V            | P | F | Ι | G            | L            | 13    |
| 28 | 263 | Н            | R | F | S            | K | R | R | D            | s            | 13    |
| 29 | 275 | V            | Ι | L | Α            | N | I | Y | L            | L            | 13    |
| 30 | 305 | $\mathbf{L}$ | R | L | F            | Н | V | Α | Т            | Н            | 13    |
| 31 | 30  | Α            | F | P | L            | С | s | L | Y            | L            | 12    |
| 32 | 34  | C            | S | L | Y            | L | I | Α | v            | L            | 12    |
| 33 | 37  | Y            | L | I | Α            | ٧ | L | G | N            | L            | 12    |
| 34 | 51  | V            | R | T | E            | Н | s | L | Н            | Е            | 12    |
| 35 | 60  | P            | М | Y | Ι            | F | L | С | М            | L            | 12    |
| 36 | 75  | I            | s | Т | s            | S | М | P | K            | M            | 12    |
| 37 | 93  | T            | I | Q | F            | D | Α | С | L            | L            | 12    |
| 38 | 123 | D            | R | Y | V            | A | Ι | С | Н            | P            | 12    |
| 39 | 135 | A            | Т | V | L            | T | L | Ρ | R            | V            | 12    |
| 40 | 138 | L            | T | L | P            | R | V | T | K            | Ι            | 12    |
| 41 | 149 | Α            | A | V | V            | R | G | Α | А            | $\mathbf{L}$ | 12    |
| 42 | 155 | Α            | A | L | M            | A | P | L | P            | V            | 12    |
| 43 | 168 | L            | P | F | С            | R | S | N | Ι            | L            | 12    |
| 44 | 181 | C            | L | Н | Q            | D | V | M | K            | L            | 12    |
| 45 | 188 | K            | L | A | С            | D | D | I | R            | V            | 12    |
| 46 | 190 | Α            | С | D | D            | I | R | ٧ | N            | V            | 12    |
| 47 | 195 | R            | V | N | V            | V | Y | G | $\mathbf{L}$ | Ι            | 12    |
| 48 | 210 | G            | L | D | S            | L | L | Ι | S            | F            | 12    |
| 49 | 213 | S            | L | L | Ι            | S | F | S | Y            | L            | 12    |
| 50 | 220 | Y            | L | L | Ι            | L | K | T | V            | L            | 12    |
| 51 | 248 | Α            | V | F | Ι            | F | Y | V | P            | F            | 12    |
| 52 | 279 | N            | Ι | Y | $\mathbf{L}$ | L | V | P | P            | V            | 12    |
| 53 | 287 | V            | L | N | Ρ            | Ι | V | Y | G            | V            | 12    |
| 54 | 296 | K            | T | K | Ε            | I | R | Q | R            | I            | 12    |
| 55 | 299 | E            | Ι | R | Q            | R | I | L | R            | L            | 12    |

# HLA-B\*5101 nonomers(SEQ ID NOS 2064-2132, respectively in order of appearance)

|    | Pos | 1 | 2 | 3            | 4 | 5 | 6 | 7 | 8 | 9 | score |
|----|-----|---|---|--------------|---|---|---|---|---|---|-------|
| 1  | 39  | I | A | V            | L | G | N | L | Т | I | 26    |
| -2 | 31  | F | P | L            | C | S | L | Y | L | I | 25    |
| 3  | 120 | M | A | F            | D | R | Y | V | Α | I | 24    |
| 4  | 130 | H | P | L            | R | Н | Α | Т | V | L | 23    |
| 5  | 118 | L | A | М            | Α | F | D | R | Y | v | 22    |
| 6  | 140 | L | P | R            | ٧ | Т | K | I | G | v | 22    |
| 7  | 155 | A | A | L            | М | Α | P | L | P | v | 22    |
| 8  | 42  | L | G | N            | L | Т | I | I | Y | I | 21    |
| 9  | 254 | V | P | $\mathbf{F}$ | I | G | L | s | М | v | 21    |
| 10 | 284 | V | P | P            | V | L | N | P | Ι | v | 21    |
|    |     |   |   |              |   |   |   |   |   |   | 27    |

HLA-B\*5101 nonomers(SEQ ID NOS 2064-2132, respectively in order of appearance)

|     | Pos | 1            | 2        | 3      | 4 | r | _ | 7 | 8 | 9          | score |
|-----|-----|--------------|----------|--------|---|---|---|---|---|------------|-------|
| 11  | 160 | L            |          | 5<br>F | 4 | 5 | 6 |   |   |            | 20    |
| .11 | 168 |              | P        |        | C | R | s | N | I | L          | 20    |
| 12  | 235 | Q            | A        | K      | A | F | G | T | C | V          | 20    |
| 13  | 138 | L            | T        | L      | P | R | V | T | K | ı          | 19    |
| 14  | 159 | A            | P        | L      | Р | V | F | Ι | K | Q          | 18    |
| 15  | 189 | L            | A        | C      | D | D | I | R | V | N          | 18    |
| 16  | 198 | V            | v        | Y      | G | L | I | V | I | I          | 18    |
| 17  | 277 | L            | A        | N      | Ι | Y | L | L | V | P          | 18    |
| 18  | 207 | S            | A        | I      | G | L | D | S | L | L          | 17    |
| 19  | 283 | L            | v        | P      | P | V | L | N | P | I          | 17    |
| 20  | 63  | I            | F        | L      | C | M | L | S | G | I          | 16    |
| 21  | 86  | I            | F        | W      | F | N | S | Т | T | I          | 16    |
| 22  | 110 | S            | G        | M      | E | S | T | V | L | L          | 16    |
| 23  | 144 | T            | K        | 1      | G | V | A | A | V | v<br>-     | 16    |
| 24  | 149 | A            | A        | V      | ٧ | R | G | A | A | L          | 16    |
| 25  | 197 | N            | <b>v</b> | V      | Y | G | L | Ι | V | I          | 16    |
| 26  | 271 | s            | P        | L      | P | V | I | L | A | N          | 16    |
| 27  | 280 | I            | Y        | L      | L | V | P | P | V | L          | 16    |
| 28  | 3   | D            | P        | N      | G | N | E | S | S | A          | 15    |
| 29  | 40  | A            | V        | L      | G | N | L | Т | Ι | Ι          | 15    |
| 30  | 97  | D            | A        | С      | L | L | Q | Ι | F | A          | 15    |
| 31  | 132 | L            | R        | Н      | A | Т | V | L | Т | L          | 15    |
| 32  | 222 | L            | I        | L      | K | Т | V | L | G | L          | 15    |
| 33  | 279 | N            | Ι        | Y      | L | L | V | P | Р | , <b>v</b> | 15    |
| 34  | 285 | P            | P        | V      | L | N | Ρ | Ι | V | Y          | 15    |
| 35  | 289 | N            | P        | Ι      | V | Y | G | V | K | T          | 15    |
| 36  | 9   | S            | S        | A      | Т | Y | F | I | L | Ι          | 14    |
| 37  | 65  | L            | C        | M      | L | S | G | Ι | D | I          | 14    |
| 38  | 84  | L            | A        | Ι      | F | W | F | N | S | T          | 14    |
| 39  | 126 | V            | A        | Ι      | С | Н | Р | L | R | Н          | 14    |
| 40  | 157 | L            | M        | A      | P | L | P | V | F | Ι          | 14    |
| 41  | 158 | M            | A        | P      | L | P | V | F | Ι | K          | 14    |
| 42  | 191 | С            | D        | D      | I | R | V | N | V | V          | 14    |
| 43  | 200 | Y            | G        | L      | Ι | V | Ι | Ι | S | A          | 14    |
| 44  | 209 | I            | G        | L      | D | S | L | L | I | S          | 14    |
| 45  | 215 | L            | I        | S      | F | S | Y | L | L | Ι          | 14    |
| 46  | 219 | S            | Y        | L      | L | Ι | L | K | Т | V          | 14    |
| 47  | 220 | Y            | L        | L      | Ι | L | K | Т | V | L          | 14    |
| 48  | 237 | K            | A        | F      | G | T | С | V | S | Н          | 14    |
| 49  | 247 | С            | A        | V      | F | Ι | F | Y | V | P          | 14    |
| 50  | 249 | V            | F        | Ι      | F | Y | V | Р | F | I          | 14    |
| 51  | 251 | Ι            | F        | Y      | V | P | F | Ι | G | L          | 14    |
| 52  | 257 | I            | G        | L      | S | M | V | H | R | F          | 14    |
| 53  | 268 | R            | R        | D      | S | P | L | Ρ | V | I          | 14    |
| 54  | 273 | L            | P        | V      | Ι | L | A | N | Ι | Y          | 14    |
| 55  | 29  | L            | A        | F      | ₽ | L | С | S | Ļ | Y          | 13    |
| 56  | 33  | $\mathbf{L}$ | С        | S      | L | Y | L | Ι | A | V          | 13    |
| 57  | 55  | Н            | S        | L      | Н | Ε | P | M | Y | 1          | 13    |
| 58  | 67  | М            | L        | S      | G | I | D | Ι | L | I          | 13    |
| 59  | 80  | M            | P        | K      | M | L | A | Ι | F | W          | 13    |
|     |     |              |          |        |   |   |   |   |   |            | 28    |

HLA-B\*5101 nonomers(SEQ ID NOS 2064-2132, respectively in order of appearance)

|    | Pos | 1 | 2 | 3 | 4 | 5 | 6            | 7 | 8 | 9 | score |
|----|-----|---|---|---|---|---|--------------|---|---|---|-------|
| 60 | 95  | Q | F | D | Α | С | L            | L | Q | I | 13    |
| 61 | 98  | Α | C | L | L | Q | I            | F | A | I | 13    |
| 62 | 104 | F | A | Ι | Н | s | $\mathbf{L}$ | S | G | M | 13    |
| 63 | 146 | I | G | V | Α | A | V            | V | R | G | 13    |
| 64 | 148 | V | A | Α | V | V | R            | G | Α | A | 13    |
| 65 | 153 | R | G | Α | A | L | М            | Α | P | L | 13    |
| 66 | 233 | E | A | Q | A | K | Α            | F | G | T | 13    |
| 67 | 243 | V | S | Н | V | С | Α            | V | F | I | 13    |
| 68 | 292 | V | Y | G | V | K | Т            | K | E | I | 13    |
| 69 | 296 | K | T | K | E | Ι | R            | Q | R | I | 13    |

Please replace Table XXVII, beginning at page 201, line 1, with the following rewritten

### Table XXVII:

#### HLA Class I decamers

HLA-A1 decamers (SEQ ID NOS 2133-2153, respectively in order of appearance)

|    | Pos | 1 | 2                        | 3 | 4 | 5            | 6            | 7                           | 8 | 9 | 0 | score |
|----|-----|---|--------------------------|---|---|--------------|--------------|-----------------------------|---|---|---|-------|
| 1  | 191 | C | $\underline{\mathtt{D}}$ | D | 1 | R            | V            | $\underline{\mathbf{N}}$    | V | v | Y | 27    |
| 2  | 244 | s | $\underline{\mathbf{H}}$ | v | C | A            | V            | F                           | I | F | Y | 24    |
| 3  | 40  | Α | $\underline{v}$          | L | G | N            | $\mathbf{L}$ | $\underline{\mathbf{T}}$    | Ι | I | Y | 21    |
| 4  | 284 | v | $\underline{\mathbf{P}}$ | P | V | L            | N            | P                           | I | v | Y | 21    |
| 5  | 116 | v | $\underline{\mathbf{L}}$ | L | A | М            | Α            | $\underline{\mathbf{F}}$    | D | R | Y | 20    |
| 6  | 28  | W | $\overline{\mathbf{r}}$  | A | F | P            | $\mathbf{L}$ | <u>c</u>                    | S | L | Y | 18    |
| 7  | 297 | Т | K                        | E | Ι | R            | Q            | R                           | I | L | R | 17    |
| 8  | 21  | G | $\overline{\mathbf{r}}$  | E | E | A            | Q            | F                           | W | L | A | 16    |
| 9  | 22  | L | $\mathbf{E}$             | E | A | Q            | F            | $\underline{w}$             | L | A | F | 16    |
| 10 | 52  | R | $\underline{\mathbf{T}}$ | E | Н | S            | L            | <u>H</u>                    | E | P | M | 16    |
| 11 | 53  | T | $\underline{\mathbf{E}}$ | H | S | $\mathbf{L}$ | Н            | $\underline{\mathbf{E}}$    | P | M | Y | 16    |
| 12 | 57  | L | <u>H</u>                 | E | P | M            | Y            | Ī                           | F | L | C | 16    |
| 13 | 111 | G | $\underline{M}$          | E | S | T            | V            | $\overline{\mathbf{r}}$     | L | A | M | 16    |
| 14 | 272 | P | $\underline{\mathbf{L}}$ | P | ٧ | Ι            | L            | $\underline{\underline{A}}$ | N | I | Y | 16    |
| 15 | 1   | М | $\underline{\mathbf{v}}$ | D | P | N            | G            | $\overline{\mathbf{N}}$     | E | s | s | 15    |
| 16 | 4   | P | N                        | G | N | E            | s            | $\underline{\mathbf{s}}$    | A | T | Y | 15    |
| 17 | 121 | A | $\underline{\mathbf{F}}$ | D | R | Y            | V            | A                           | Ι | C | Н | 15    |
| 18 | 171 | C | R                        | S | N | Ι            | L            | <u>s</u>                    | Н | s | Y | 15    |
| 19 | 211 | L | $\underline{\mathbf{D}}$ | S | L | L            | Ι            | $\underline{s}$             | F | s | Y | 15    |
| 20 | 8   | E | <u>s</u>                 | s | Α | Т            | Y            | $\underline{\mathbf{F}}$    | 1 | L | Ι | 13    |
| 21 | 190 | Α | $\underline{C}$          | D | D | Ι            | R            | $\underline{v}$             | N | v | V | 13    |

HLA-A\*0201 decamers (SEQ ID NOS 2154-2253, respectively in order of appearance)

Pos 1 2 3 4 5 6 7 8 9 0 score

HLA-A\*0201 decamers (SEQ ID NOS 2154-2253, respectively in order of appearance)

| in order or appearance) |     |              |   |              |              |   |                             |              |   |   |              |       |
|-------------------------|-----|--------------|---|--------------|--------------|---|-----------------------------|--------------|---|---|--------------|-------|
|                         | Pos | 1            | 2 | 3            | 4            | 5 | 6                           | 7            | 8 | 9 | 0            | score |
| 1                       | 221 | $\mathbf{L}$ | L | Ι            | $\mathbf{L}$ | K | $\underline{\mathbf{T}}$    | V            | L | G | $\mathbf{L}$ | 30    |
| 2                       | 100 | L            | L | Q            | I            | F | A                           | I            | Н | s | L            | 29    |
| 3                       | 282 | L            | L | V            | P            | P | V                           | L            | N | ₽ | Ι            | 27    |
| 4                       | 205 | I            | I | S            | Α            | I | $\mathbf{G}$                | L            | D | s | L            | 26    |
| 5                       | 213 | S            | L | L            | I            | s | F                           | s            | Y | L | L            | 25    |
| 6                       | 56  | S            | L | Н            | E            | Р | M                           | Y            | I | F | L            | 24    |
| 7                       | 62  | Y            | I | F            | L            | C | M                           | L            | s | G | Ι            | 24    |
| 8                       | 108 | s            | L | s            | G            | М | E                           | s            | т | v | L            | 24    |
| 9                       | 117 | L            | L | Α            | М            | Α | F                           | D            | R | Y | v            | 24    |
| 10                      | 131 | P            | L | R            | Н            | Α | $_{\mathrm{T}}^{-}$         | v            | L | т | L            | 24    |
| 11                      | 137 | v            | L | т            | L            | P | R                           | v            | т | ĸ | Ι            | 24    |
| 12                      | 215 |              | I | s            | F            | s | Ÿ                           | L            | L | I | L            | 24    |
| 13                      | 38  |              | I | Α            | v            | L | G                           | N            | L | T | I            | 23    |
| 14                      | 41  |              | L | G            | N            | L | T                           | I            | I | Y | ī            | 23    |
| 15                      | 156 |              | L | М            | A            | P | -<br>L                      | P            | V | F | I            | 23    |
| 16                      | 193 |              | I | R            | V            | N | v                           | V            | Y | G | L            | 23    |
| 17                      | 214 |              | L | I            | s            | F | s                           | Y            | ь | L | I            | 23    |
| 18                      | 32  |              | L | C            | s            | L |                             | L            | I | A | A<br>T       | 22    |
| 19                      |     |              | M | A            | F            |   | Y                           |              |   |   |              |       |
|                         | 119 |              |   |              |              | D | R                           | Y            | V | A | I            | 22    |
| 20                      | 237 |              | A | F            | G            | T | C                           | V            | S | H | v            | 22    |
| 21                      | 275 |              | I | L            | A            | N | Ī                           | Y            | L | L | V            | 22    |
| 22                      | 85  |              | I | F            | W            | F | N                           | S            | T | T | Ι            | 21    |
| 23                      | 139 |              | L | P            | R            | V | T                           | K            | Ι | G | V            | 21    |
| 24                      | 202 |              | Ι | V            | Ι            | Ι | <u>s</u>                    | A            | Ι | G | L            | 21    |
| 25                      | 13  |              | F | Ι            | L            | Ι | $\underline{G}$             | L            | Р | G | L            | 20    |
| 26                      | 16  | L            | Ι | G            | L            | Ρ | $\underline{\mathbf{G}}$    | L            | E | Е | A            | 20    |
| 27                      | 29  |              | A | F            | P            | L | $\underline{c}$             | S            | L | Y | L            | 20    |
| 28                      | 142 | R            | V | Т            | K            | Ι | $\underline{G}$             | V            | A | A | V            | 20    |
| 29                      | 148 | V.           | Α | A            | V            | V | $\underline{\mathbf{R}}$    | G            | Α | A | L            | 20    |
| 30                      | 167 | Q            | L | P            | F            | С | $\underline{\mathbf{R}}$    | S            | И | Ι | $\mathbf{L}$ | 20    |
| 31                      | 180 | Y            | С | L            | Н            | Q | $\overline{\mathbf{D}}$     | V            | М | K | L            | 20    |
| 32                      | 222 | $\mathbf{L}$ | I | $\mathbf{L}$ | K            | Т | $\overline{\Lambda}$        | L            | G | L | Т            | 20    |
| 33                      | 240 | G            | Т | С            | V            | S | <u>H</u>                    | V            | С | A | V            | 20    |
| 34                      | 248 | Α            | V | F            | I            | F | $\underline{\underline{Y}}$ | V            | P | F | Ι            | 20    |
| 35                      | 250 | F            | I | F            | Y            | V | $\underline{\mathtt{P}}$    | F            | Ι | G | L            | 20    |
| 36                      | 271 | S            | P | L            | P            | V | $\underline{\mathtt{I}}$    | $\mathbf{L}$ | Α | N | I            | 20    |
| 37                      | 279 | N            | I | Y            | L            | L | $\underline{v}$             | P            | P | V | L            | 20    |
| 38                      | 304 | I            | L | R            | L            | F | H                           | V            | Α | T | Н            | 20    |
| 39                      | 10  | S            | A | Т            | Y            | F | I                           | L            | I | G | L            | 19    |
| 40                      | 15  | I            | L | Ι            | G            | L | $\mathbf{P}$                | G            | L | E | E            | 19    |
| 41                      | 27  | F            | W | L            | Α            | F | P                           | L            | С | s | L            | 19    |
| 42                      | 35  | s            | L | Y            | L            | Ι | A                           | v            | L | G | N            | 19    |
| 43                      | 37  | Y            | L | I            | Α            | V | L                           | G            | N | L | Т            | 19    |
| 44                      | 44  | N            | L | Т            | Ι            | I | Y                           | Ι            | V | R | Т            | 19    |
| 45                      | 64  |              | L | С            | М            | L | s                           | G            | Ι | D | I            | 19    |
| 46                      | 83  |              | L | A            | I            | F | W                           | F            | N | s | т            | 19    |
| 47                      | 159 |              | P | L            | P            | v | F                           | I            | K | Q | L            | 19    |
| 48                      | 189 |              | A | C            | D            | D | Ī                           | R            | v | N | v            | 19    |
| 49                      | 207 |              | A | I            | G            | L | Ē<br>D                      | s            | L | L | I            | 19    |
| 50                      | 253 |              | v | P            | F            | I | G                           | L            | s |   | v            | 19    |
|                         |     | •            | - | -            | -            | - | =                           | _            | _ |   | •            | 30    |
|                         |     |              |   |              |              |   |                             |              |   |   |              | 50    |

HLA-A\*0201 decamers(SEQ ID NOS 2154-2253, respectively in order of appearance)

|          | TH OLG     | ier (        | ΟL     | a      | pр           | ea     | I a                                  | nc     | e,           |        |        |          |
|----------|------------|--------------|--------|--------|--------------|--------|--------------------------------------|--------|--------------|--------|--------|----------|
|          | Pos        | 1            | 2      | 3      | 4            | 5      | 6                                    | 7      | 8            | 9      | 0      | score    |
| 51       | 276        | I            | L      | А      | И            | Ι      | $\underline{\underline{Y}}$          | L      | L            | v      | Р      | 19       |
| 52       | 281        | Y            | L      | L      | V            | P      | <u>P</u>                             | V      | $\mathbf{L}$ | N      | P      | 19       |
| 53       | 283        | L            | V      | P      | P            | V      | $\underline{\underline{\mathbf{L}}}$ | N      | P            | I      | V      | 19       |
| 54       | 286        | P            | V      | Ĺ      | N            | P      | Ī                                    | V      | Y            | G      | V      | 19       |
| 55       | 33         | L            | C      | s      | $\mathbf{L}$ | Y      | $\overline{\mathbf{L}}$              | I      | A            | v      | L      | 18       |
| 56       | 36         | L            | Y      | L      | I            | A      | $\underline{v}$                      | L      | G            | N      | L      | 18       |
| 57       | 39         | I            | A      | V      | L            | G      | $\overline{N}$                       | L      | $\mathbf{T}$ | I      | I      | 18       |
| 58       | 42         | $\mathbf{L}$ | G      | N      | L            | T      | Ī                                    | I      | Y            | I      | V      | 18       |
| 59       | 66         | С            | M      | L      | S            | G      | Ī                                    | D      | I            | L      | Ι      | 18       |
| 60       | 111        | G            | M      | E      | S            | T      | $\underline{v}$                      | L      | L            | A      | Μ      | 18       |
| 61       | 128        | Ι            | C      | H      | P            | L      | $\underline{R}$                      | Η      | A            | T      | V      | 18       |
| 62       | 134        | Н            | A      | T      | V            | L      | $\underline{\mathtt{T}}$             | L      | P            | R      | V      | 18       |
| 63       | 154        | G            | A      | A      | L            | M      | A                                    | P      | L            | P      | V      | 18       |
| 64       | 157        | $\mathbf{L}$ | M      | Α      | Р            | L      | <u>P</u>                             | V      | F            | I      | K      | 18       |
| 65       | 190        | Α            | C      | D      | D            | I      | $\underline{\mathtt{R}}$             | V      | N            | V      | V      | 18       |
| 66       | 229        | G            | L      | Т      | R            | E      | A                                    | Q      | A            | K      | Α      | 18       |
| 67       | 245        | H            | v      | С      | A            | V      | $\underline{\mathbf{F}}$             | Ι      | F            | Y      | V      | 18       |
| 68       | 274        | P            | V      | Ι      | L            | A      | $\overline{\mathbf{N}}$              | Ι      | Y            | L      | L      | 18       |
| 69       | 278        | Α            | N      | Ι      | Y            | L      | $\overline{\Gamma}$                  | V      | P            | P      | V      | 18       |
| 70       | 291        | I            | V      | Y      | G            | V      | K                                    | Т      | K            | E      | I      | 18       |
| 71       | 298        | K            | Ε      | Ι      | R            | Q      | <u>R</u>                             | Ι      | L            | R      | Г      | 18       |
| 72       | 48         | 1            | Y      | Ι      | V            | R      | $\underline{\mathbf{T}}$             | E      | H            | S      | L      | 17       |
| 73       | 65         | L            | С      | M      | Ļ            | S      | G                                    | I      | D            | Ι      | L      | . 17     |
| 74       | 67         | M            | L      | S      | G            | Ι      | $\overline{\mathbf{D}}$              | Ι      | L            | I      | S      | 17       |
| 75       | 74         | L            | Ι      | S      | Т            | S      | $\underline{\underline{s}}$          | M      | P            | K      | M      | 17       |
| 76       | 91         | S            | T      | Т      | Ι            | Q      | $\underline{\mathbf{F}}$             | D      | A            | C      | L      | 17       |
| 77       | 94         | Ι            | Q      | F      | D            | A      | <u>C</u>                             | L      | L            | Q      | I      | 17       |
| 78       | 188        | K            | L      | A      | С            | D      | $\overline{D}$                       |        | , R          | V      | N      | 17       |
| 79       | 197        | N            | V      | V      | Y            | G      | $\overline{\Gamma}$                  | Ι      | V            | Ι      | I      | 17       |
| 80       | 200        | Y            | G      | L      | Ι            | V      | Ī                                    | Ι      | S            | A      | Ι      | 17       |
| 81       | 218        | F            | s      | Y      | L            | L      | Ī                                    | L      | K            | T      | V      | 17       |
| 82       | 227        | V            | L      | G      | L            | T      | R                                    | Ε      | A            | Q      | A      | 17       |
| 83       | 303        | R            | I      | Ь      | R            | L      | F                                    | Н      | V            | A<br>- | Т      | 17       |
| 84       | 21         | G            | ь      | E      | E            | A      | Q                                    | F      | W            | L      | A      | 16       |
| 85       | 92         | Т            | T      | Ι      | Q            | F      | D                                    | A      | С            | L      | L      | 16       |
| 86       | 97         | D            | A      | C      | L            | Г      | Ō                                    | I      | F            | A      | Ι      | 16       |
| 87       | 127        | A            | I      | C      | H            | P      | <u>L</u>                             | R      | H            | A      | T      | 16       |
| 88       | 143        | V            | T<br>V | K<br>N | V            | G      | V                                    | A      | A            | V      | V      | 16       |
| 89<br>90 | 195<br>220 | R<br>Y       | L      |        |              | V      | Y                                    | G      | r<br>r       | L      | V<br>G | 16       |
|          |            |              |        | L      | I            | L      | K                                    | T      |              |        |        | 16       |
| 91<br>92 | 296<br>18  | K            | T<br>L | K<br>P | E<br>G       | I<br>L | R                                    | Q      | R            | I      | L      | 16       |
| 93       |            | G            |        |        |              |        | E                                    | E      | A            | Q      | F      | 15       |
| 94       | 30<br>126  | A<br>V       | F      | P      | С            | С      | <u>S</u>                             | L      | Y            | L      | I      | 15       |
| 95       |            |              | A<br>I | I<br>G | V            | H<br>A | P                                    | L<br>V | R            | Н      | A<br>G | 15       |
| 96       | 145<br>173 | K<br>S       | N      | I      | L            | S      | <u>А</u><br>Н                        | v<br>S | V<br>Y       | R<br>C | L      | 15<br>15 |
| 96       |            | G            | L      | I      | A<br>r       | S<br>I | -                                    | S      | Y<br>A       | I      | G      |          |
| 98       | 201<br>208 | A            | I      | G      | v<br>L       | D      | Ī                                    |        |              |        |        | 15<br>15 |
| 99       | 210        | G            | L      | D      | S            | ь      | $\frac{S}{L}$                        | L      | L<br>S       | I<br>F | s<br>s | 15<br>15 |
| 100      | 267        | K            | R      | R      | D            | S      | Б<br>Г                               | Г      | P            | v      | 5<br>I | 15<br>15 |
| 100      | 201        | K            | 14     | ĸ      | ט            | ی      | Ľ                                    | n      | r            | ٧      | T      | 31       |
|          |            |              |        |        |              |        |                                      |        |              |        |        | 31       |

HLA-A\*0201 decamers(SEQ ID NOS 2154-2253, respectively in order of appearance) Pos 1 2 3 4 5 6 7 8 9 0 score

HLA-A\*0203 decamers(SEQ ID NOS 2254-2301, respectively in order of appearance)

|    | Pos | 1   | 2                           | 3            | 4            | 5 | 6          | 7                           | 8 | 9 | 0 | score |
|----|-----|-----|-----------------------------|--------------|--------------|---|------------|-----------------------------|---|---|---|-------|
| 1  | 141 | P   | R                           | v            | Т            | K | Ι          | G                           | V | A | Α | 19    |
| 2  | 147 | G   | v                           | A            | Α            | v | V          | R                           | G | A | Α | 19    |
| 3  | 112 | М   | E                           | s            | Т            | v | L          | $_{ m L}$                   | А | М | Α | 18    |
| 4  | 227 | V   | L                           | G            | L            | Т | R          | E                           | Α | Q | Α | 18    |
| 5  | 229 | G   | Ŀ                           | T            | R            | E | Α          | Q                           | Α | ĸ | Α | 18    |
| 6  | 142 | R   | V                           | T            | K            | I | G          | V                           | Α | A | V | 17    |
| 7  | 148 | v   | A                           | A            | V            | v | R          | G                           | Α | A | L | 17    |
| 8  | 2   | V   | D                           | P            | N            | G | N          | E                           | S | s | Α | 10    |
| 9  | 16  | , L | I                           | G            | L            | P | G          | Ŀ                           | E | E | Α | 10    |
| 10 | 21  | G   | $\underline{\mathbf{L}}$    | E            | E            | Α | Q          | F                           | W | L | Α | 10    |
| 11 | 31  | F   | P                           | L            | С            | s | L          | Y                           | L | I | Α | 10    |
| 12 | 76  | S   | T                           | s            | S            | М | P          | K                           | М | L | A | 10    |
| 13 | 89  | F   | $\underline{N}$             | s            | $\mathbf{T}$ | Т | Ι          | Q                           | F | D | Α | 10    |
| 14 | 96  | F   | $\underline{\mathbf{D}}$    | A            | С            | L | $_{\rm L}$ | Q                           | Ι | F | Α | 10    |
| 15 | 110 | S   | $\underline{G}$             | M            | E            | S | Т          | $\underline{v}$             | L | L | Α | 10    |
| 16 | 118 | L   | A                           | M            | Α            | F | D          | R                           | Y | v | Α | 10    |
| 17 | 126 | V   | A                           | I            | С            | Н | P          | $\underline{\mathbf{L}}$    | R | H | Α | 10    |
| 18 | 140 | L   | <u>P</u>                    | R            | V            | Т | K          | $\underline{\mathtt{I}}$    | G | v | Α | 10    |
| 19 | 146 | I   | G                           | $\mathbf{v}$ | A            | Α | V          | $\underline{v}$             | R | G | Α | 10    |
| 20 | 150 | Α   | V                           | v            | R            | G | Α          | A                           | L | M | Α | 10    |
| 21 | 181 | C   | $\underline{\mathbf{L}}$    | H            | Q            | D | V          | $\underline{\underline{M}}$ | K | L | A | 10    |
| 22 | 199 | V   | Y                           | G            | $\mathbf{L}$ | I | V          | $\underline{\mathtt{I}}$    | 1 | S | Α | 10    |
| 23 | 225 | K   | $\underline{\mathbf{T}}$    | v            | L            | G | L          | $\underline{\mathtt{T}}$    | R | E | Α | 10    |
| 24 | 239 | F   | $\underline{\mathbf{G}}$    | T            | С            | V | s          | $\underline{\mathbf{H}}$    | V | C | Α | 10    |
| 25 | 269 | R   | $\underline{\mathbf{D}}$    | S            | P            | L | Ρ          | $\underline{\mathtt{v}}$    | Ι | L | A | 10    |
| 26 | 302 | Q   | R                           | I            | L            | R | L          | F                           | Н | v | Α | 10    |
| 27 | 305 | L   | $\underline{\mathbf{R}}$    | L            | F            | Н | V          | A                           | T | Н | A | 10    |
| 28 | 3   | D   | P                           | И            | G            | N | E          | S                           | S | A | Т | 9     |
| 29 | 17  | Ι   | G                           | L            | P            | G | L          | Ē                           | Ε | A | Q | 9     |
| 30 | 22  | L   | $\mathbf{E}$                | E            | A            | Q | F          | M                           | L | A | F | 9     |
| 31 | 32  | Þ   | $\overline{r}$              | C            | S            | L | Y          | ī                           | Ι | A | V | 9     |
| 32 | 77  | Т   | $\underline{s}$             | s            | M            | P | K          | M                           | L | A | Ι | 9     |
| 33 | 90  | N   | $\underline{\underline{s}}$ | T            | Т            | Ι | Q          | F                           | D | A | С | 9     |
| 34 | 97  | D   | <u>A</u>                    | С            | L            | L | Q          | Ī                           | F | A | Ι | 9     |
| 35 | 111 | G   | M                           | E            | S            | Т | V          | Ī                           | L | A | M | 9     |
| 36 | 113 | Ε   | <u>s</u>                    | T            | V            | L | L          | <u>A</u>                    | M | A | F | 9     |
| 37 | 119 | A   | $\underline{M}$             | A.           | F            | D | R          | Y                           | V | A | Ι | 9     |
| 38 | 127 | Α   | Ī                           | С            | Н            | Р | L          | $\frac{R}{}$                | Η | A | Т | 9     |
| 39 | 151 | V   | $\overline{\Lambda}$        | R            | G            | A | A          | $\overline{\Gamma}$         | M | A | Ρ | . 9   |
| 40 | 182 | L   | H                           | Q            | D            | V | М          | <u>K</u>                    | L | A | С | 9     |
| 41 | 200 | Y   | $\underline{G}$             | L            | I            | V | I          | Ī                           | S | A | I | 9     |
| 42 | 226 | Т   | $\overline{\Lambda}$        | L            | G            | L | Т          | R                           | Ε | A | Q | 9     |
| 43 | 228 | Ь   | $\underline{G}$             | L            | Т            | R | Ε          | <u>A</u>                    | Q | A | K | 9     |
|    |     |     |                             |              |              |   |            |                             |   |   |   | 32    |

### HLA-A\*0203 decamers(SEQ ID NOS 2254-2301, respectively in order of appearance)

|    | Pos | 1 | 2                        | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | score |
|----|-----|---|--------------------------|---|---|---|---|---|---|---|---|-------|
| 44 | 230 | L | T                        | R | E | A | Q | A | K | A | F | 9     |
| 45 | 240 | G | T                        | C | V | S | Н | V | C | A | v | 9     |
| 46 | 270 | D | $\underline{\mathbf{s}}$ | P | L | P | V | I | L | A | N | 9     |
| 47 | 303 | R | I                        | L | R | L | F | Н | V | A | Т | 9     |
| 48 | 306 | R | L                        | F | Н | V | Α | Т | Н | Α | S | 9     |

## HLA-A26 decamers (SEQ ID NOS 2302-2366, respectively in order of appearance)

|    | order or appearance, |              |   |   |                           |   |              |              |   |              |              |       |  |
|----|----------------------|--------------|---|---|---------------------------|---|--------------|--------------|---|--------------|--------------|-------|--|
|    | Pos                  | 1            | 2 | 3 | 4                         | 5 | 6            | 7            | 8 | 9            | 0            | score |  |
| 1  | 299                  | E            | I | R | Q                         | R | Ι            | L            | R | L            | F            | 31    |  |
| 2  | 193                  | D            | Ι | R | V                         | N | V            | V            | Y | G            | L            | 29    |  |
| 3  | 250                  | F            | Ι | F | Y                         | V | P            | F            | I | G            | L            | 25    |  |
| 4  | 256                  | F            | I | G | L                         | S | М            | V            | Н | R            | F            | 25    |  |
| 5  | 74                   | L            | I | S | Т                         | S | s            | М            | Ρ | K            | М            | 24    |  |
| 6  | 274                  | P            | V | I | $\mathbf{L}_{\mathbf{I}}$ | Α | N            | I            | Y | $\mathbf{L}$ | L            | 24    |  |
| 7  | 18                   | G            | L | P | G                         | L | Е            | E            | А | Q            | F            | 23    |  |
| 8  | 116                  | ν            | L | L | Α                         | М | A            | F            | D | R            | Y            | 23    |  |
| 9  | 205                  | I            | I | S | Α                         | I | G            | L            | D | s            | $\mathbf{L}$ | 23 .  |  |
| 10 | 221                  | L            | L | Ι | $\mathbf{L}$              | K | Т            | V            | L | G            | Ļ            | 23    |  |
| 11 | 230                  | $\mathbf{L}$ | Т | R | $\mathbf{E}$              | Α | Q            | A            | K | A            | F            | 23    |  |
| 12 | 13                   | Y            | F | Ι | L                         | I | G            | $\mathbf{L}$ | P | G            | L            | 22    |  |
| 13 | 40                   | Α            | v | L | G                         | N | L            | T            | I | I            | Y            | 22    |  |
| 14 | 56                   | S            | L | Н | E                         | P | М            | Y            | I | F            | L            | 22    |  |
| 15 | 95                   | Q            | F | D | Α                         | С | L            | L            | Q | Ι            | F            | 22    |  |
| 16 | 215                  | L            | I | S | F                         | s | Y            | L            | L | I            | L            | 22    |  |
| 17 | 92                   | T            | Т | I | Q                         | F | D            | Α            | C | L            | L            | 21    |  |
| 18 | 100                  | L            | L | Q | I                         | F | Α            | I            | Н | s            | L            | 21    |  |
| 19 | 103                  | Ι            | F | Α | I                         | Н | s            | L            | s | G            | М            | 21    |  |
| 20 | 296                  | K            | Т | K | E                         | Ι | R            | Q            | R | I            | L            | 21    |  |
| 21 | 28                   | W            | L | Α | F                         | P | $\mathbf{L}$ | С            | s | L            | Y            | 20    |  |
| 22 | 131                  | P            | L | R | Н                         | A | Т            | V            | L | $\mathbf{T}$ | L            | 20    |  |
| 23 | 59                   | E            | P | М | Y                         | 1 | F            | L            | С | М            | L            | 19    |  |
| 24 | 91                   | s            | Т | T | Ι                         | Q | F            | D            | Α | С            | L            | 19    |  |
| 25 | 202                  | L            | I | V | Ι                         | I | s            | Α            | 1 | G            | L            | 19    |  |
| 26 | 212                  | D            | s | L | L                         | I | s            | F            | s | Y            | L            | 19    |  |
| 27 | 272                  | P            | L | P | v                         | 1 | L            | Α            | N | I            | Y            | 19    |  |
| 28 | 279                  | N            | I | Y | L                         | L | v            | P            | P | v            | L            | 19    |  |
| 29 | 52                   | R            | Т | E | Н                         | s | L            | Н            | E | P            | М            | 18    |  |
| 30 | 62                   | Y            | I | F | L                         | C | М            | L            | s | G            | I            | 18    |  |
| 31 | 72                   | D            | Ι | L | I                         | s | T            | S            | S | М            | P            | 18    |  |
| 32 | 108                  | s            | L | S | G                         | М | E            | S            | Т | v            | L            | 18    |  |
| 33 | 113                  | Е            | S | T | V                         | L | L            | Α            | М | Α            | F            | 18    |  |
| 34 | 151                  | V            | V | R | G                         | Α | Α            | L            | М | Α            | P            | 18    |  |
| 35 | 78                   | s            | s | M | P                         | K | М            | L            | A | I            | F            | 17    |  |
| 36 | 142                  | R            | V | Т | K                         | I | G            | v            | Α | Α            | V            | 17    |  |
| 37 | 162                  | P            | V | F | I                         | K | Q            | L            | P | F            | С            | 17    |  |
| 38 | 164                  | F            | I | K | Q                         | L | P            | F            | С | R            | s            | 17    |  |
|    |                      |              |   |   |                           |   |              |              |   |              |              | 33    |  |
|    |                      |              |   |   |                           |   |              |              |   |              |              |       |  |

### HLA-A26 decamers (SEQ ID NOS 2302-2366, respectively in order of appearance)

|    | order or appearance) |   |   |   |   |              |   |   |   |              |              |       |  |
|----|----------------------|---|---|---|---|--------------|---|---|---|--------------|--------------|-------|--|
|    | Pos                  | 1 | 2 | 3 | 4 | 5            | 6 | 7 | 8 | 9            | 0            | score |  |
| 39 | 167                  | Q | L | P | F | С            | R | S | N | 1            | L            | 17    |  |
| 40 | 185                  | D | V | M | K | L            | Α | С | D | D            | 1            | 17    |  |
| 41 | 248                  | Α | V | F | 1 | F            | Y | V | P | F            | Ι            | 17    |  |
| 42 | 253                  | Y | V | P | F | I            | G | L | S | М            | V            | 17    |  |
| 43 | 45                   | L | T | I | Ι | Y            | Ι | V | R | Т            | E            | 16    |  |
| 44 | 145                  | K | I | G | ٧ | Α            | Α | V | V | R            | G            | 16    |  |
| 45 | 198                  | v | ٧ | Y | G | L            | I | V | Ι | I            | S            | 16    |  |
| 46 | 203                  | I | V | I | I | S            | A | I | G | L            | D            | 16    |  |
| 47 | 209                  | I | G | L | D | S            | L | L | I | S            | F            | 16    |  |
| 48 | 213                  | s | L | L | Ι | S            | F | s | Y | L            | $\mathbf{L}$ | 16    |  |
| 49 | 255                  | P | F | I | G | L            | S | М | V | Н            | R            | 16    |  |
| 50 | 264                  | R | F | S | K | R            | R | D | S | P            | $\mathbf{L}$ | 16    |  |
| 51 | 294                  | G | V | K | T | K            | E | I | R | Q            | R            | 16    |  |
| 52 | 16                   | L | I | G | L | P            | G | L | Е | Ε            | А            | 15    |  |
| 53 | 80                   | M | P | K | М | L            | A | I | F | W            | F            | 15    |  |
| 54 | 114                  | S | Т | V | L | $\mathbf{L}$ | A | M | Α | F            | D            | 15    |  |
| 55 | 155                  | Α | Α | L | M | A            | P | L | P | V            | F            | 15    |  |
| 56 | 159                  | Α | P | L | P | V            | F | Ι | K | Q            | L            | 15    |  |
| 57 | 174                  | N | Ι | L | S | Н            | S | Y | С | $\mathbf{L}$ | H            | 15    |  |
| 58 | 197                  | N | V | V | Y | G            | L | I | V | Ι            | Ι            | 15    |  |
| 59 | 210                  | G | L | D | S | L            | L | Ι | S | F            | S            | 15    |  |
| 60 | 214                  | L | L | I | S | F            | S | Y | L | $\mathbf{L}$ | I            | 15    |  |
| 61 | 222                  | L | Ι | L | K | T            | V | L | G | L            | T            | 15    |  |
| 62 | 240                  | G | Т | С | V | S            | Н | V | С | Α            | V            | 15    |  |
| 63 | 247                  | C | A | V | F | I            | F | Y | V | P            | F            | 15    |  |
| 64 | 286                  | P | V | L | N | P            | Ι | V | Y | G            | V            | 15    |  |
| 65 | 298                  | K | E | Ι | R | Q            | R | Ι | L | R            | L            | 15    |  |
|    |                      |   |   |   |   |              |   |   |   |              |              |       |  |

### HLA-A3 decamers (SEQ ID NOS 2367-2432, respectively in order of appearance)

|    | Pos | 1            | 2 | 3                        | 4 | 5 | 6                                    | 7                        | 8 | 9 | 0 | score |
|----|-----|--------------|---|--------------------------|---|---|--------------------------------------|--------------------------|---|---|---|-------|
| 1  | 136 | T            | v | $\overline{\mathbf{r}}$  | Т | L | <u>P</u>                             | <u>R</u>                 | V | T | K | 31    |
| 2  | 287 | V            | L | N                        | P | I | $\underline{\mathtt{v}}$             | $\underline{\mathbf{Y}}$ | G | v | K | 28    |
| 3  | 223 | I            | L | ĸ                        | Т | V | $\overline{\Gamma}$                  | $\overline{\mathbf{G}}$  | L | T | R | 27    |
| 4  | 304 | 1            | L | $\underline{R}$          | L | F | $\underline{\mathbf{H}}$             | $\underline{v}$          | Α | T | H | 27    |
| 5  | 73  | I            |   | I                        |   |   |                                      |                          |   |   | K | 26    |
| 6  | 15  | I            | L | I                        | G | L | P                                    | $\underline{\mathbf{G}}$ | L | E | E | 23    |
| 7  | 40  | Α            | v | Ŀ                        | G | N | $\overline{\mathbf{r}}$              | $\underline{\mathbf{T}}$ | I | I | Y | 23    |
| 8  | 150 | Α            | V | $\underline{\mathtt{v}}$ | R | G | A                                    | <u>A</u>                 | L | M | A | 23    |
| 9  | 258 | G            | L | <u>s</u>                 | М | V | H                                    | $\underline{R}$          | F | S | K | 23    |
| 10 | 18  | G            | L | P                        | G | L | E                                    | E                        | Α | Q | F | 22    |
| 11 | 303 | R            | I | $\overline{\mathbf{r}}$  | R | L | $\underline{\mathbf{F}}$             | $\underline{\mathbf{H}}$ | V | A | T | 22    |
| 12 | 276 | I            | L | A                        | N | I | $\underline{\underline{Y}}$          | $\overline{\mathbf{r}}$  | L | v | Þ | 21    |
| 13 | 28  | W            | L | <u>A</u>                 | F | P | ഥ                                    | $\underline{C}$          | S | L | Y | 20    |
| 14 | 115 | Т            | v | L                        | L | A | $\underline{\underline{M}}$          | A                        | F | D | R | 20    |
| 15 | 116 | V            | L | $\underline{\mathbf{L}}$ | Α | М | $\underline{\underline{\mathbf{A}}}$ | $\underline{\mathbf{F}}$ | D | R | Y | 20    |
| 16 | 125 | Y            | V | <u>A</u>                 | I | С | $\overline{H}$                       | <u>P</u>                 | L | R | Н | 20    |
| 17 | 131 | P            | L | <u>R</u>                 | Н | Α | $\underline{\mathbf{T}}$             | V                        | L | T | L | 20    |
| 18 | 144 | $\mathbf{T}$ | K | Ī                        | G | V | <u>A</u>                             | <u>A</u>                 | V | v | R | 20    |
|    |     |              |   |                          |   |   |                                      |                          |   |   |   | 34    |

HLA-A3 decamers (SEQ ID NOS 2367-2432, respectively in order of appearance)

|    | Pos | 1 | 2 | 3                                    | 4 | 5 | 6                        | 7                                    | 8            | 9 | 0            | score |
|----|-----|---|---|--------------------------------------|---|---|--------------------------|--------------------------------------|--------------|---|--------------|-------|
| 19 | 156 | Α | L | M                                    | A | ₽ | <u>L</u>                 | P                                    | V            | F | I            | 20    |
| 20 | 195 | R | v | N                                    | ٧ | ٧ | Y                        | G                                    | L            | I | V            | 20    |
| 21 | 35  | S | L | $\underline{\mathbf{Y}}$             | L | Ι | A                        | v                                    | L            | G | N            | 19    |
| 22 | 272 | P | L | P                                    | V | I | Ŀ                        | A                                    | N            | I | Y            | 19    |
| 23 | 37  | Y | L | I                                    | Α | V | Ŀ                        | G                                    | N            | L | $\mathbf{T}$ | 18    |
| 24 | 49  | Y | I | v                                    | R | T | E                        | H                                    | S            | L | Н            | 18    |
| 25 | 50  | I | v | $\underline{R}$                      | Т | E | H                        | $\underline{s}$                      | L            | Н | Е            | 18    |
| 26 | 108 | S | L | $\underline{s}$                      | G | Μ | E                        | $\underline{s}$                      | Т            | v | L            | 18    |
| 27 | 142 | R | v | $\underline{\mathbf{T}}$             | K | Ι | g                        | $\overline{\Lambda}$                 | A            | A | V            | 18    |
| 28 | 188 | K | L | A                                    | С | D | $\underline{\mathtt{D}}$ | <u>I</u>                             | R            | v | N            | 18    |
| 29 | 279 | N | I | $\underline{\mathtt{Y}}$             | L | L | $\underline{v}$          | <u>P</u>                             | P            | ٧ | L            | 18    |
| 30 | 291 | I | V | $\underline{\underline{Y}}$          | G | V | K                        | $\underline{\mathbf{T}}$             | K            | E | I            | 18    |
| 31 | 294 | G | V | ĸ                                    | Т | K | E                        | I                                    | R            | Q | R            | 18    |
| 32 | 46  | т | I | <u>I</u>                             | Y | Ι | $\underline{v}$          | $\underline{\mathbf{R}}$             | Т            | E | Н            | 17    |
| 33 | 102 | Q | I | F                                    | A | I | H                        | $\underline{\mathbf{s}}$             | $\mathbf{L}$ | s | G            | 17    |
| 34 | 151 | V | V | R                                    | G | A | A                        | L                                    | Μ            | A | Р            | 17    |
| 35 | 179 | S | Y | $\underline{c}$                      | L | Н | $\underline{Q}$          | D                                    | V            | M | K            | 17    |
| 36 | 203 | I | v | <u>I</u>                             | Ι | S | <u>A</u>                 | I                                    | G            | L | D            | 17    |
| 37 | 204 | V | I | I                                    | S | Α | Ī                        | $\underline{\mathbf{G}}$             | L            | D | s            | 17    |
| 38 | 220 | Y | L | $\underline{\mathbf{L}}$             | Ι | L | K                        | $\underline{\mathbf{T}}$             | V            | L | G            | 17    |
| 39 | 221 | L | L | Ī                                    | L | K | $\underline{\mathtt{T}}$ | $\underline{v}$                      | L            | G | L            | 17    |
| 40 | 227 | v | L | $\underline{\mathbf{G}}$             | L | T | $\underline{\mathbf{R}}$ | E                                    | A            | Q | Α            | 17    |
| 41 | 242 | C | v | S                                    | Н | V | <u>C</u>                 | A                                    | V            | F | I            | 17    |
| 42 | 289 | N | P | Ī                                    | V | Y | G                        | $\underline{v}$                      | K            | T | K            | 17    |
| 43 | 38  | L | I | A                                    | V | L | G                        | <u>N</u>                             | L            | T | I            | 16    |
| 44 | 85  | Α | I | F                                    | W | F | N                        | $\underline{\mathbf{s}}$             | Т            | T | I            | 16    |
| 45 | 147 | G | v | A                                    | Α | Λ | V                        | $\underline{R}$                      | G            | A | Α            | 16    |
| 46 | 198 | V | V | $\underline{\underline{Y}}$          | G | L | <u>I</u>                 | $\underline{v}$                      | I            | I | S            | 16    |
| 47 | 201 | G | L | I                                    | V | I | <u>I</u>                 | $\underline{s}$                      | Α            | I | G            | 16    |
| 48 | 214 | L | L | I                                    | S | F | <u>s</u>                 | $\underline{\underline{\mathbf{Y}}}$ | $\mathbf{r}$ | L | 1            | 16    |
| 49 | 226 | Т | V | $\underline{\mathbf{L}}$             | G | L | $\underline{\mathbf{T}}$ | $\underline{\mathbf{R}}$             | Ε            | A | Q            | 16    |
| 50 | 228 | L | G | $\overline{\mathbf{r}}$              | Т | R | $\underline{\mathbf{E}}$ | $\underline{\mathbf{A}}$             | Q            | A | K            | 16    |
| 51 | 229 | G | L | $\underline{\mathbf{T}}$             | R | E | <u>A</u>                 | Q                                    | A            | K | Α            | 16    |
| 52 | 1   | M | V | $\overline{\mathbf{D}}$              | P | N | $\underline{G}$          | $\overline{N}$                       | E            | S | S            | 15    |
| 53 | 44  | N | L | $\underline{\underline{\mathbf{T}}}$ | Ι | 1 | Y                        | Ī                                    | V            | R | T            | 15    |
| 54 | 47  | I | I | $\underline{\underline{Y}}$          | I | V | $\underline{R}$          | $\underline{\mathbf{T}}$             | E            | H | s            | 15    |
| 55 | 67  | M | L | $\underline{s}$                      | G | I | D                        | Ī                                    | L            | I | S            | 15    |
| 56 | 72  | D | I | $\overline{\Gamma}$                  | 1 | S | T                        | <u>s</u>                             | S            | M | Р            | 15    |
| 57 | 99  | С | L | Ŀ                                    | Q | Ι | F                        | A                                    | Ι            | H | S            | 15    |
| 58 | 105 | A | I | H                                    | S | L | S                        | $\underline{\mathbf{G}}$             | M            | E | S            | 15    |
| 59 | 145 | K | I | $\underline{\mathbf{G}}$             | ٧ | A | A                        | V                                    | V            | R | G            | 15    |
| 60 | 175 | Ι | L | <u>s</u>                             | Н | S | <u>Y</u>                 | <u>C</u>                             | L            | Н | Q            | 15    |
| 61 | 191 | С | D | $\overline{\mathbf{D}}$              | I | R |                          |                                      | V            | V | Y            | 15    |
| 62 | 208 | A | I | $\underline{\mathbf{G}}$             | L | D | <u>s</u>                 | $\overline{\mathbf{r}}$              | L            | I | S            | 15    |
| 63 | 275 | V | I | L                                    | A | N | ī                        | $\underline{\mathtt{Y}}$             | L            | L | V            | 15    |
| 64 | 281 | Y | L | $\overline{\mathbf{L}}$              | V | P | P                        | v                                    | L            | N | P            | 15    |
| 65 | 299 | E | I | <u>R</u>                             | Q | R | Ī                        | $\overline{\Gamma}$                  | R            | L | F            | 15    |
| 66 | 306 | R | L | F                                    | Н | V | <u>A</u>                 | $\frac{\mathbf{T}}{}$                | H            | A | S            | 15    |
|    |     |   |   |                                      |   |   |                          |                                      |              |   |              |       |

HLA-B\*0702 decamers(SEQ ID

### NOS 2433-2492, respectively in order of appearance)

| in order or appearance) |       |     |     |              |   |              |   |   |    |              |       |
|-------------------------|-------|-----|-----|--------------|---|--------------|---|---|----|--------------|-------|
|                         | Pos   | 1 2 | 3   | 4            | 5 | 6            | 7 | 8 | 9  | 0            | score |
| 1                       | 159   | AF  | , L | P            | V | F            | Ι | K | Q  | L            | 23    |
| 2                       | 59    | EF  | M   | Y            | Ι | F            | L | С | M  | L            | 22    |
| 3                       | 273   | LF  | V   | 1            | L | A            | N | Ι | Y  | L            | 20    |
| 4                       | 3     | DI  | N   | G            | N | E            | S | s | A  | Т            | 19    |
| 5                       | 130   | н   | L   | R            | Н | Α            | Т | V | L  | Т            | 19    |
| 6                       | 140   | LF  | R   | v            | Т | K            | I | G | v  | Α            | 19    |
| 7                       | 161   | LE  | v   | F            | I | K            | Q | L | P  | F            | 19    |
| 8                       | 31    | FF  |     | С            | s | L            | Y | L | I  | Α            | 18    |
| 9                       | 271   | SI  |     | P            | v | I            | L | A | N  | Ι            | 18    |
| 10                      | 80    | M E |     |              | L | A            | I | F | W  | F            | 16    |
| 11                      | 108   | SI  |     | G            | М | E            | s | Т | v  | L            | 16    |
|                         |       |     |     | Н            | A | Т            | v | L | T  | Ь            | 15    |
| 12                      | 131   |     |     |              |   |              |   |   |    |              |       |
| 13                      | 264   | RE  |     | K            | R | R            | D | S | P  | L            | 15    |
| 14                      | 33    | LO  |     | L            | Y | L            | I | A | ٧  | L            | 14    |
| 15                      | 109   | LS  |     | М            | Е | s            | T | V | L  | L            | 14    |
| 16                      | 152   | VF  |     |              | A | L            | M | A | P  | L            | 14    |
| 17                      | 205   | Ι ] |     | Α            | 1 | G            | L | D | S  | L            | 14    |
| 18                      | 215   | L ] | S   | F            | S | Y            | L | L | Ι  | L            | 14    |
| 19                      | 268   | RI  | D   | S            | P | L            | Ρ | V | I  | L            | 14    |
| 20                      | 29    | L A | A F | Р            | L | C            | S | L | Y  | L            | 13    |
| 21                      | 148   | V   | A A | V            | V | R            | G | A | A  | $\mathbf{r}$ | 13    |
| 22                      | 156   | AI  | M   | Α            | P | $\mathbf{L}$ | Ρ | V | F  | Ι            | 13    |
| 23                      | 193   | D I | R   | V            | N | V            | V | Y | G  | L            | 13    |
| 24                      | 221   | LI  | I   | $\mathbf{L}$ | K | T            | V | L | G  | L            | 13    |
| 25                      | 298   | KI  | E I | R            | Q | R            | Ι | L | R  | L            | 13    |
| 26                      | 7     | NI  | S   | S            | Α | T            | Y | F | I  | L            | 12    |
| 27                      | 19    | LI  | ? G | L            | E | Ė            | Α | Q | F  | W            | 12    |
| 28                      | 24    | E 2 | A Q | F            | W | L            | Α | F | p  | L            | 12    |
| 29                      | 119   | AI  | 1 A | F            | D | R            | Y | v | A  | I            | 12    |
| 30                      | 129   | CI  | I P | L            | R | Н            | A | Т | v  | L            | 12    |
| 31                      | 206   | 1 : | 3 A | I            | G | L            | D | s | L. | L            | 12    |
| 32                      |       | S   | Z L | L            | 1 | L            | K | Т | v  | L            | 12    |
| 33                      |       |     | ΕY  |              | L | v            | P | Р | v  | Ь            | 12    |
| 34                      |       |     | > v |              | N | P            | Ι | v | Y  | G            | 12    |
| 35                      |       |     | 5 S |              | Т | Y            | F | Ι | L  | I            | 11    |
| 36                      |       |     | 7 I |              | I | G            | L | P | G  | L            | 11    |
| 37                      |       |     | J L |              | F | P            | L | C | S  | L            | 11    |
| 38                      |       |     |     |              | R | Т            | E | Н | s  | L            | 11    |
| 39                      |       |     | LH  |              | P | М            | Y | I | F  | L            | 11    |
| 40                      |       |     | C M |              | s | G            | Ι | D | I  | L            | 11    |
| 41                      |       |     | 5 T |              | S | М            | P | K |    | L            | 11    |
| 42                      |       |     | 3 S |              | P | K            | M | L | A  | I            | 11    |
|                         |       |     |     |              |   |              | D | A | C  |              | 11    |
| 43                      |       |     |     |              | Q | F            |   |   |    | L            |       |
| 44                      |       |     | RY  |              | A | Ι            | C | Н | P  | L            | 11    |
| 45                      |       |     | V I |              |   | G            | V | A | A  | V            | 11    |
| 46                      |       |     | CL  |              |   | D            | V | M | K  | L            | 11    |
| 47                      |       |     |     |              |   | R            | V | N | v  | V            | 11    |
| 4.8                     |       |     | S I |              | Ι | S            | F | S | Y  | Ь            | 11    |
| 49                      |       |     | Q A |              |   | F            | G | T | C  | V            | 11    |
| 50                      |       |     | V S |              |   | C            | A | V | F  | I            | 11    |
| 51                      | . 248 | A ' | V F | , I          | F | Y            | V | Ρ | F  | Ι            | 11    |
|                         |       |     |     |              |   |              |   |   |    |              | 36    |

HLA-B\*0702 decamers(SEQ ID NOS 2433-2492, respectively in order of appearance) Pos 1 2 3 4 5 6 7 8 9 0 score 52 250 FIFYVPFIGL 11 53 254 V P F I G L S M V H 11 54 266 SKRRDSPLPV 11 55 267 KRRDSPLPVI 11 RDSPLPVILA 56 269 11 57 278 ANIYLLVPPV 11 58 284 V P P V L N P I V Y 11 59 289 N P I V Y G V K T K 11 60 296 KTKEIRQRIL 11

Please replace Table XXVIII, beginning at page 205, line 1, with the following rewritten

#### Table XXVIII:

#### -- Table XXVIII:

HLA Class II Epitopes (sample 15-mer length)

(SEQ ID NOS 2493-2595, respectively in order of appearance) HLA-DRB1\*0101 15-mers

| Pos    | 1 | 2 | 3            | 4 | 5      | 6 | 7      | 8 | 9 | 0            | 7 | 2      | 3 | 4      | 5            | score |
|--------|---|---|--------------|---|--------|---|--------|---|---|--------------|---|--------|---|--------|--------------|-------|
| 1 200  | Y |   | L            | I | V      | I | ,<br>I | S | A | Ι            | G | L      | D | S      | L            | 36    |
| 2 68   | L | _ | G            | I | v<br>D | I | L      | I | S | Т            | S | S      | М | P      | K            | 34    |
| 3 62   | Y | _ | F            | ь | C      | м | L      | S | G | I            | D | I      | L | I      | S            | 33    |
| 4 103  | I | F | r<br>A       | I | Н      | S | L      | S | G | М            | E | S      | Т | V      | L            | 32    |
| 5 45   | L | _ | I            | ı | л<br>Y |   | A<br>n | R | T | E            | Н | S      | L | H      | E            | 31    |
| 6 193  |   |   |              | v |        |   | V      |   | G |              |   | S<br>V | I | n<br>I | E<br>S       | 31    |
|        | D | _ | R            | • |        |   | -      | Y | _ | L            | I | •      | _ |        |              |       |
|        | ь |   | И            | I | Y      | L | L      | V | P | P            | V | L      | N | P      | Ι            | 31    |
| 8 97   | D |   |              | L |        | Q | Ι      | F | A | Ι            | Н | S      | L | S      | G            | 30    |
| 9 106  | I | H | S            | L | S      | G | M      | E | S | Т            | V | L      | Г |        | M            | 30    |
| 10 240 | G |   | _            | v | S      | H | V      | C | A |              | F | I      | F | _      | v            | 30    |
| 11 10  | S |   | _            | Y | F      | I | L      | I | G | L            | P | G      | L | E      | E            | 29    |
| 12 289 | N | _ | Ι            | V |        | _ | V      | K |   | K            | E | I      | R | Q      | R            | 29    |
| 13 11  | A | _ | Y            | F | I      | L | Ι      |   | L | P            | G | L      | E | E      | Α            | 28    |
| 14 250 | F | _ | F            | Y | V      | P | F      | Ι | G |              | S | M      | V | H      | R            | 27    |
| 15 140 | L |   | R            | v |        | K | Ι      |   | V |              | A |        | V | R      | G            | 26    |
| 16 183 | H | ~ | D            | V |        | K | L      | A | _ | D            | D | Ι      | R | V      | N            | 26    |
| 17 217 | s | F | S            | Y | L      | L | Ι      | L | K | T            | V | L      | G | L      | Т            | 26    |
| 18 16  | L | Ι | G            | L | P      | G | L      | E | E | A            | Q | F      | W | L      | A            | 25    |
| 19 24  | E | Α | Q            | F | W      | L | Α      | F | P | $\mathbf{L}$ | С | S      | L | Y      | $\mathbf{L}$ | 25    |
| 20 36  | L | Y | $\mathbf{L}$ | I | Α      | V | L      | G | N | $\mathbf{L}$ | T | Ι      | 1 | Y      | Ι            | 25    |
| 21 70  | G | Ι | D            | I | L      | I | S      | T | S | S            | М | P      | K | M      | $\mathbf{L}$ | 25    |
| 22 111 | G | М | E            | S | Т      | v | L      | L | Α | М            | Α | F      | D | R      | Y            | 25    |
| 23 148 | V | Α | Α            | v | V      | R | G      | Α | A | L            | М | Α      | Р | L      | P            | 25    |
| 24 162 | P | V | F            | I | K      | Q | L      | Р | F | С            | R | S      | N | I      | L            | 25    |
| 25 197 | N | V | V            | Y | G      | L | I      | V | I | I            | S | Α      | I | G      | L            | 25    |
| 26 211 | L | D | s            | L | L      | I | s      | F | s | Y            | L | L      | I | L      | K            | 25    |

### HLA-DRB1\*0101 15-mers

| D       |   |   |   |        |   |   |   |              |              |   |              |              |   |              |   |       |   |
|---------|---|---|---|--------|---|---|---|--------------|--------------|---|--------------|--------------|---|--------------|---|-------|---|
| Pos     | 1 | 2 | 3 | 4      | 5 | 6 | 7 | 8            | 9            | 0 | 1            | 2            | 3 | 4            | 5 | score |   |
| 27 218  | F | S | Y | L      | L | I | L | K            | $\mathbf{T}$ | V | L            | G            | L | $\mathbf{T}$ | R | 25    |   |
| 28 13   | Y | F | I | L      | Ι | G | L | P            | G            | L | E            | E            | Α | Q            | F | 24    |   |
| 29 30   | Α | F | P | L      | С | s | L | Y            | L            | I | Α            | V            | L | G            | N | 24    |   |
| 30 39   | I | A | V | L      | G | N | L | Т            | I            | I | Y            | I            | V | R            | т | 24    |   |
| 31 77   | т | s | s | м      | Р | ĸ | М | L            | Α            | I | F            | W            | F | N            | s | 24    |   |
| 32 85   | Α | Ι | F | W      | F | N | s | т            | T            | Ι | Q            | F            | D | Α            | С | 24    |   |
| 33 137  | v | L | Т | L      | Р | R | v | т            | ĸ            | I | G            | v            | Α | Α            | V | 24    |   |
| 34 151  | v | v | R | G      | A | Α | L | М            | A            | P | L            | Р            | v | F            | Ι | 24    |   |
| 35 161  | L | P | V | F      | Ι | ĸ | Q | L            | P            | F | C            | R            | s | N            | I | 24    |   |
| 36 196  | v | N | v | v      | Ŷ | G | L | I            | v            | Ī | I            | s            | A | I            | G | 24    |   |
| 37 202  | L | I | V | I      | I | s | A | I            | G            | L | D            | s            | L | L            | ī | 24    |   |
| 38 208  | A | I | Ġ | L      | D | s | L | L            | I            | s | F            | S            | Y | L            | L | 24    |   |
| 39 248  | A | v | F | ī      | F | Y | V | P            | F            | I | G            | L            | s | М            | v | 24    |   |
| 40 251  | I | F | Y | v      | P | F | I | G            | L            | S | М            | V            | Н | R            | F | 24    |   |
| 41 83   | м | L | Ā | ĭ      | F | W | F | И            | S            | Т | Т            | I            | Q | F            | D | 23    |   |
| 42 101  | L | 0 | I | F      | A | ĭ | Н | S            | L            | s | G            | М            | E | S            | T | 23    |   |
| 43 165  | I | K |   | L      | P | F | С | R            | S            | N | I            | L            | S | Н            | S | 23    |   |
| 44 203  | I | V | Q |        |   | A | Ι | G            |              |   |              | L            | L | I            | S | 23    |   |
| 45 221  |   |   | I | I      | S |   |   |              | L<br>G       | D | S            |              | E |              |   | 23    |   |
|         | L | L | I | L      | K | T | V | L            |              | L | Т            | R            |   | A            | Q | 23    |   |
| 46 278  | A | N | Ι | Y      | Г | Г | V | P            | P            | V | L            | N            | P | I            | V | 23    |   |
| 47 , 27 | F | W | Г | A<br>- | F | P | L | С            | S            | L | Y            | L            | I | A            | V |       |   |
| 48 35   | S | L | Y | L      | I | A | V | L            | G            | N | L            | T            | I | Ι            | Y | 22    |   |
| 49 61   | M | Y | I | F      | L | C | M | L            | s<br>-       | G | I            | D            | Ι | L            | I | 22    |   |
| 50 65   | L | C | M | L      | S | G | I | D            | I            | L | I            | S            | Т | S            | S | 22    |   |
| 51 80   | M | P | K | M      | L | A | Ι | F            | W            | F | N            | S            | T | Т            | Ι | 22    |   |
| 52 145  | K | Ι | G | ٧      | A | A | V | V            | R            | G | A            | A            | L | M            | A | 22    |   |
| 53 146  | I | G | V | A      | A | v | V | R            | G            | A | A            | L            | M | A            | P | 22    |   |
| 54 154  | G | A | A | L      | M | A | P | L            | P            | V | F            | I            | K | Q            | L | 22    |   |
| 55 205  | I | I | S | A      | I | G | L | D            | s            | L | $\mathbf{L}$ | Ι            | S | F            | S | 22    |   |
| 56 243  | V | S | H | V      | C | A | V | F            | I            | F | Y            | V            | P | F            | Ι | 22    |   |
| 57 270  | D | S | Р | L      | Р | V | I | L            | A            | N | I            | Y            | L | L            | V | 22    |   |
| 58 274  | P | V | Ι | L      | A | N | I | Y            | L            | L | V            | P            | P | V            | L | 22    |   |
| 59 281  | Y | L | L | v      | P | P | V | L            | N            | Р | I            | V            | Y | G            | V | 22    |   |
| 60 34   | C | S | L | Y      | L | I | Α | V            | L            | G | N            | L            | Т | .I           | Ι | 21    |   |
| 61 69   | S | G | Ι | D      | I | L | I | s            | T            | S | S            | M            | Р | K            | M | 21    |   |
| 62 152  | V | R | G | Α      | A | L | M | A            | P            | L | P            | V            | F | Ι            | K | 21    |   |
| 63 299  | E | Ι | R | Q      | R | I | L | R            | L            | F | Н            | V            | Α | Т            | H | 21    |   |
| 64 100  | L | L | Q | I      | F | A | I | Η            | S            | L | S            | G            | М | E            | S | 20    |   |
| 65 135  | A | Т | V | L      | T | L | Р | R            | v            | Т | K            | Ι            | G | V            | A | 20    |   |
| 66 141  | P |   | V |        | K | I | G | V            | Α            |   |              | V            | R | G            | Α | 20    |   |
| 67 191  | С | D | D | I      | R | V | И | V            | V            | Y | G            | L            | I | V            | I | 20    |   |
| 68 199  | V | Y | G | L      | Ι | V | I | I            | S            | A | I            | G            | L | D            | S | 20    |   |
| 69 262  | V | Η | R | F      | S | K | R | R            | D            | S | Р            | L            | Р | V            | Ι | 20    | ) |
| 70 271  | S | Ρ | L | P      | V | I | L | Α            | N            | I | Y            | L            | L | V            | Ρ | 20    |   |
| 71 28   | W | L | Α | F      | P | L | C | S            | L            | Y | L            | I            | Α | V            | L | 19    | ) |
| 72 58   | H | E | P | M      | Y | I | F | L            | C            | М | L            | S            | G | I            | D | 19    | ) |
| 73 59   | E | P | М | Y      | I | F | L | C            | M            | L | s            | G            | 1 | D            | I | 19    | ) |
| 74 60   | P | M | Y | I      | F | L | C | М            | L            | S | G            | Ι            | D | Ι            | L | 19    | ) |
| 75 98   | A | С | L | L      | Q | I | F | А            | I            | Н | s            | L            | s | G            | М | 19    | ) |
| 76 215  | L | I | S | F      | S | Y | L | L            | I            | L | K            | $\mathbf{T}$ | V | L            | G | 19    | ) |
| 77 219  | s | Y | L | L      | Ι | L | K | $\mathbf{T}$ | v            | L | G            | L            | Т | R            | E | 19    | ) |
|         |   |   |   |        |   |   |   |              |              |   |              |              | 3 | 38           |   |       |   |
|         |   |   |   |        |   |   |   |              |              |   |              |              |   |              |   |       |   |

### HLA-DRB1\*0101 15-mers

|     | Pos | 1 | 2 | 3  | 4          | 5  | 6 | 7            | 8            | 9 | 0            | 1 | 2       | 3            | 4            | 5            | score |
|-----|-----|---|---|----|------------|----|---|--------------|--------------|---|--------------|---|---------|--------------|--------------|--------------|-------|
| 78  | 228 | L | G | L  | T          | R  | E | Α            | Q            | A | K            | Α | F       | G            | Т            | С            | 19    |
| 79  | 232 | R | E | Α  | Q          | Α  | ĸ | Α            | F            | G | т            | С | V       | s            | Н            | V            | 19    |
| 80  | 246 | v | С | Α  | v          | F  | I | F            | Y            | v | P            | F | Ι       | G            | L            | s            | 19    |
| 81  | 297 | T | K | E  | I          | R  | Q | R            | Ι            | L | R            | L | F       | Н            | v            | Α            | 19    |
| 82  | 3   | D | P | N  | G          | N  | E | s            | s            | A | $\mathbf{T}$ | Y | F       | I            | L            | I            | 18    |
| 83  | 14  | F | I | L  | I          | G  | L | Р            | G            | L | E            | E | Α       | Q            | F            | W            | 18    |
| 84  | 25  | A | Q | F  | W          | L  | Α | F            | P            | L | С            | S | L       | Y            | $\mathbf{L}$ | I            | 18    |
| 85  | 42  | L | G | N  | L          | Т  | I | I            | Y            | I | V            | R | ${f T}$ | E            | Н            | s            | 18    |
| 86  | 46  | T | I | I  | Y          | I  | v | $\mathbf{R}$ | $\mathbf{T}$ | E | Н            | S | L       | Н            | E            | P            | 18    |
| 87  | 78  | S | s | М  | P          | K  | M | L            | Α            | I | F            | M | F       | N            | S            | T            | 18    |
| 88  | 84  | L | Α | I  | F          | W  | F | N            | S            | T | $\mathbf{T}$ | Ι | Q       | F            | D            | Α            | 18    |
| 89  | 89  | F | N | S  | T          | Т  | I | Q            | F            | D | A            | C | L       | L            | Q            | Ι            | 18    |
| 90  | 93  | T | 1 | Q  | F          | D  | A | C            | L            | L | Q            | I | F       | А            | I            | Н            | 18    |
| 91  | 115 | T | V | L  | L          | A  | M | Α            | F            | D | R            | Y | V       | Α            | Ι            | C            | 18    |
| 92  | 119 | A | M | Α  | F          | D  | R | Y            | V            | A | I            | С | H       | P            | L            | R            | 18    |
| 93  | 127 | A | 1 | С  | H          | P  | L | R            | Η            | Α | Т            | V | L       | $\mathbf{T}$ | L            | P            | 18    |
| 94  | 129 | C | H | P  | L          | R  | H | A            | Т            | v | L            | Т | L       | P            | R            | V            | 18    |
| 95  | 147 | G | V | A  | . <b>A</b> | V  | v | R            | G            | A | A            | L | М       | A            | P            | $\mathbf{L}$ | 18    |
| 96  | 149 | Α | Α | V  | v          | R  | G | A            | A            | L | M            | Α | Р       | $\mathbf{L}$ | Ρ            | V            | 18    |
| 97  | 216 | I | S | F  | S          | Y  | L | , L          | I            | L | K            | Т | V       | L            | G            | L            | 18    |
| 98  | 227 | V | L | G  | L          | Т  | R | E            | Α            | Q | A            | K | Α       | F            | G            | Т            | 18    |
| 99  | 249 | v | F | I  | F          | Y  | v | Р            | F            | I | G            | L | s       | М            | V            | H            | 18    |
| 100 | 253 | Y | V | P  | F          | Ι  | G | L            | S            | M | V            | H | R       | F            | S            | K            | 18    |
|     | 284 |   | P | P  | V          | L  | N | P            | Ι            |   | Y            |   | V       |              | Т            | K            | 18    |
|     | 286 |   | V | L  | N          | Р  | I | V            | Y            | G | V            | K | Т       | K            | Ε            | Ι            | 18    |
| 103 | 303 | R | Т | Τ. | R          | τ. | F | H            | V            | Α | Т            | Н | Α       | S            | E            | Ρ            | 18    |

# HLA-DRB1\*0301 (DR17) 15-mers (SEQ ID NOS 2596-2671, respectively in order of appearance)

| :  | Pos | 7 | 2 | 3            | 4 | 5            | 6 | 7 | 8            | 9 | 0 | 1            | 2 | 3 | 4  | 5            | score |
|----|-----|---|---|--------------|---|--------------|---|---|--------------|---|---|--------------|---|---|----|--------------|-------|
| 1  | 16  | L | I | G            | L | P            | G | L | E            | E | Ā | Q            | F | W | L  | A            | 26    |
| 2  | 206 | I | S | A            | I | G            | L | D | s            | L | L | I            | s | F | s  | Y            | 23    |
| 3  | 91  | s | Т | Т            | I | Q            | F | D | Α            | C | L | L            | Q | Ι | F  | Α            | 22    |
| 4  | 117 | L | L | A            | M | Α            | F | D | R            | Y | V | Α            | I | С | Н  | P            | 22    |
| 5  | 38  | L | I | Α            | v | L            | G | N | L            | T | I | I            | Y | I | V  | R            | 21    |
| 6  | 179 | s | Y | C            | L | Н            | Q | D | V            | M | K | L            | Α | С | D  | D            | 21    |
| 7  | 211 | L | D | s            | L | L            | I | s | F            | s | Y | L            | L | I | L  | K            | 21    |
| 8  | 219 | s | Y | L            | L | I            | L | K | Т            | v | L | G            | L | Т | R  | E            | 21    |
| 9  | 272 | P | L | P            | v | I            | L | Α | N            | I | Y | L            | L | V | Р  | P            | 21    |
| 10 | 26  | Q | F | W            | L | Α            | F | P | L            | С | S | L            | Y | L | Ι  | А            | 20    |
| 11 | 114 | S | Т | V            | L | L            | A | М | Α            | F | D | R            | Y | V | Α  | Ι            | 20    |
| 12 | 129 | C | Н | P            | L | R            | H | Α | $\mathbf{T}$ | v | L | Т            | L | P | R  | V            | 20    |
| 13 | 134 | н | Α | $\mathbf{T}$ | v | $\mathbf{L}$ | T | L | P            | R | V | Т            | K | I | G  | V            | 20    |
| 14 | 186 | v | М | K            | L | Α            | C | D | D            | I | R | V            | N | V | V  | Y            | 20    |
| 15 | 200 | Y | G | L            | I | V            | I | Ι | s            | A | Ι | G            | L | D | s  | L            | 20    |
| 16 | 270 | D | s | P            | L | P            | v | Ι | L            | A | N | I            | Y | L | L  | V            | 20    |
| 17 | 297 | T | K | E            | I | R            | Q | R | I            | L | R | $\mathbf{L}$ | F | Н | V  | Α            | 20    |
| 18 | 11  | A | T | Y            | F | I            | L | I | G            | L | P | G            | L | E | E  | Α            | 19    |
| 19 | 54  | E | Н | s            | L | Н            | E | P | М            | Y | Ι | F            | L | C | М  | $\mathbf{L}$ | 19    |
|    |     |   |   |              |   |              |   |   |              |   |   |              |   | 3 | 39 |              |       |

HLA-DRB1\*0301 (DR17) 15-mers (SEQ ID NOS 2596-2671, respectively in order of appearance)

| Pos                  | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5                               | score    |
|----------------------|---|----------|
| 20 106               | IHSLSGMESTVLLAM   | 19       |
| 21 165               | IKQLPFCRSNILSHS   | 19       |
| 22 191               | CDDIRVNVVYGLIVI   | 19       |
| 23 203               | IVIISAIGLDSLLIS   | 19       |
| 24 213               | SLLISFSYLLILKTV   | 19       |
| 25 224               | LKTVLGLTREAQAKA   | 19       |
| 26 227               | V L G L T R E A Q A K A F G T                               | 19       |
| 27 248               | AVFIFYVPFIGLSMV   | 19       |
| 28 254               | <b>V</b> P F <b>I</b> G <b>L</b> S M <b>V</b> H R F S K R   | 19       |
| 29 277               | LANIYLLVPPVLNPI   | 19       |
| 30 36                | LYLIAVLGNLTIIYI   | 18       |
| 31 93                | TIQFDACLLQIFAIH   | 18       |
| 32 98                | ACLLQIFAIHSLSGM   | 18       |
| 33 125               | YVAICHPLRHATVLT   | 18       |
| 34 1 <sup>′</sup> 58 | MAPLPVFIKQLPFCR   | 18       |
| 35 187               | M K L A C D D I R V N V V Y G                               | 18       |
| 36 217               | SFSYLLILKTVLGLT   | 18       |
| 37 225               | KTVLGLTREAQAKAF   | 18       |
| 38 281               | YLLVPPVLNPIVYGV   | 18       |
| 39 288               | LNPIVYGVKTKEIRQ   | 18       |
| 40 18                | GLPGLEEAQFWLAFP   | 17       |
| 41 44                | NLTIIYIVRTEHSLH   | 17       |
| 42 145               | K I G V A A V V R G A A L M A                               | 17       |
| 43 159               | APLPVFIKQLPFCRS   | 17       |
| 44 256               | FIGLSMVHRFSKRRD   | 17       |
| 45 259               | LSMVHRFSKRRDSPL   | 17       |
| 46 137               | V L T L P R V T K I G V A A V                               | 16       |
| 47 262               | V H R F S K R R D S P L P V I                               | 16       |
| 48 294               | GVKTKEIRQRILRLF   | 16       |
| 49 46                | TIIYIVRTEHSLHEP   | 15       |
| 50 51                | V R T E H S L H E P M Y I F L                               | 15       |
| 51 172               | RSNILSHSYCLHQDV   | 15       |
| 52 189               | LACDDIRVNVVYGLI   | 15       |
| 53 212               | DSLLISFSYLLILKT   | 15       |
| 54 218               | FSYLLILKTVLGLTR   | 15       |
| 55 271               | S P L P V I L A N I Y L L V P                               | 15       |
| 56 279               | NIYLLVPPVLNPIVY   | 15<br>14 |
| 57 12                | TYFILIGLPGLEEAQ   | 14       |
| 58 35                | SLYLIAVLGNLTIIY   |          |
| 59 64                | FLCMLSGIDILISTS   | 14<br>14 |
| 60 140               | LPRVTKIGVAAVVRG   |          |
| 61 273               | LPVILANIYLLVPPV   | 14<br>14 |
| 62 301               | RQRILRLFHVATHAS   | 13       |
| 63 13                | YFILIGLPGLEEAQF   | 13       |
| 64 47                | IIYIVRTEHSLHEPM   | 13       |
| 65 71                | I D I L I S T S S M P K M L A M P K M L A I F W F N S T T I | 13       |
| 66 80                |   | 13       |
| 67 109               |   |          |
| 68 113               |   | 13       |
|                      | 40  |          |

HLA-DRB1\*0301 (DR17) 15-mers (SEQ ID NOS 2596-2671, respectively in order of appearance)

|    | Pos | 1 | 2            | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0            | 1            | 2            | 3 | 4 | 5 | score |
|----|-----|---|--------------|---|---|---|---|---|---|---|--------------|--------------|--------------|---|---|---|-------|
| 69 | 135 | A | $\mathbf{T}$ | v | L | т | L | Р | R | v | Т            | K            | I            | G | V | A | 13    |
| 70 | 195 | R | V            | N | v | V | Y | G | L | I | V            | Ι            | I            | s | Α | Ι | 13    |
| 71 | 202 | L | Ι            | V | I | I | s | Α | Ι | G | L            | D            | s            | L | L | Ι | 13    |
| 72 | 220 | Y | L            | L | I | L | K | т | V | L | G            | L            | $\mathbf{T}$ | R | Ė | Α | 1.3   |
| 73 | 221 | L | L            | Ι | L | K | T | V | L | G | $\mathbf{L}$ | T            | R            | E | Α | Q | 13    |
| 74 | 264 | R | F            | s | K | R | R | D | s | P | L            | Р            | V            | I | L | Α | 13    |
| 75 | 280 | I | Y            | L | L | V | P | Р | V | L | N            | P            | I            | V | Y | G | 13    |
| 76 | 302 | Q | R            | I | L | R | L | F | Н | v | Α            | $\mathbf{T}$ | Н            | Α | S | E | 13    |

HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

|    | Pos | _             | _      | _   | _      |        | _            | _             | 7             | 0      | 9 | 0            | 1            | 2  | 3 | 4  | 5            | score    |
|----|-----|---------------|--------|-----|--------|--------|--------------|---------------|---------------|--------|---|--------------|--------------|----|---|----|--------------|----------|
| 1  | 36  | 1<br><b>L</b> | 2<br>Y |     | 3<br>L | 4<br>I | 5<br>A       | 6<br><b>V</b> | 7<br><b>L</b> | 8<br>G | N | L            | T            | I  | I | Ϋ́ | I            | 26       |
| 2  | 45  | L             | T      |     | I      | I      | Y            | I             | v             | R      | T | E            | Н            | s  | L | Н  | Ē            | . 26     |
| 3  | 68  | L             | S      |     | G      | I      | D            | I             | L             | I      | s | Т            | S            | s  | М | P  | K            | 26       |
| 4  | 83  | M             | L      |     | A      | I      | F            | w             | F             | N      | s | Т            | T            | I  | 0 | F  | D            | 26       |
| 5  | 134 | н             |        |     | T      | v      | ь            | T             | L             | P      | R | v            | $\mathbf{T}$ | ĸ  | ī | G  | v            | 26       |
| 6  | 145 | ĸ             | I      |     | G      | v      | Α            | Α             | v             | v      | R | G            | Α            | Α  | L | М  | Α            | 26       |
| 7  | 224 | L             | K      | ,   | T      | v      | L            | G             | L             | т      | R | E            | Α            | Q  | Α | ĸ  | Α            | 26       |
| 8  | 227 | v             | L      | , ( | G      | L      | Т            | R             | E             | Α      | Q | Α            | K            | Α  | F | G  | Т            | 26       |
| 9  | 256 | F             | 1      |     | G      | L      | s            | M             | v             | Н      | R | F            | S            | К  | R | R  | D            | 26       |
| 10 | 281 | Y             | I      | . : | L      | v      | P            | P             | v             | L      | N | Р            | Ι            | V  | Y | G  | V            | 26       |
| 11 | 289 | N             | P      | •   | Ι      | v      | Y            | G             | v             | K      | T | K            | E            | I  | R | Q  | R            | 26       |
| 12 | 301 | R             | Ç      | ) : | R      | I      | $\mathbf{L}$ | R             | L             | F      | н | V            | A            | Т  | Н | A  | s            | 26       |
| 13 | 11  | А             | Т      | •   | Y      | F      | I            | L             | I             | G      | L | P            | G            | L  | Е | E  | Α            | 22       |
| 14 | 24  | E             | P      |     | Q      | F      | W            | L             | A             | F      | P | L            | C            | S  | L | Y  | L            | 22       |
| 15 | 25  | A             | Ç      | )   | F      | W      | L            | A             | F             | P      | L | C            | s            | L  | Y | L  | I            | 22       |
| 16 | 34  | C             | ٤      | ;   | L      | Y      | Ŀ            | I             | Α             | V      | L | G            | N            | L  | Т | Ι  | Ι            | 22       |
| 17 | 84  | L             | P      | 1   | I      | F      | W            | F             | N             | S      | Т | $\mathbf{T}$ | I            | Q  | F | D  | Α            | 22       |
| 18 | 122 | F             | Γ      | )   | R      | Y      | V            | A             | I             | C      | H | P            | L            | R. | H | A  | $\mathbf{T}$ | 22       |
| 19 | 197 | N             | . 1    | 7   | V      | Y      | G            | L             | I             | V      | I | I            | S            | A  | I | G  | L            | 22       |
| 20 | 215 | L             | 1      |     | S      | F      | S            | Y             | L             | L      | I | L            | K            | Т  | V | L  | G            | 22       |
| 21 | 217 | S             | E      | 7   | S      | Y      | L            | L             | I             | L      | K | Т            | V            | L  | G | L  | Т            | 22       |
| 22 | 250 | F             | ' ]    | -   | F      | Y      | V            | P             | F             | Ι      | G | L            | S            | M  | V | Н  | R            | 22       |
| 23 | 278 | A             |        |     | Ι      | Y      | L            | L             | V             | Р      | P | V            | L            | N  | P | Ι  | V            | 22       |
| 24 | 19  | I             |        |     | G      | L      | Е            | E             | A             | Q      | F | W            | L            | A  | F | P  | L            | 20       |
| 25 | 30  | æ             |        |     | Р      | L      | C            | S             | L             | Y      | L | I            | A            | V  | L | G  | N            | 20       |
| 26 | 33  | Ι             |        |     | S      | L      | Y            | L             | I             | A      | V | L            | G            | N  | L | T  | Ι            | 20       |
| 27 | 35  | S             | _      | _   | Y      | L      | Ι            | A             | ٧             |        | G | И            | L            | T  | I | I  | Y            | 20       |
| 28 | 39  | 1             |        | _   | V      | L      | G            | N             |               | Т      | I | I            | Y            | I  | V | R  | T            | 20       |
| 29 | 42  | I             |        |     | N      | L      | Т            | I             | Ι             | Y      | I | V            | R            | T  | E | H  | S            | 20       |
| 30 | 44  | 1             | _      | -   | T      | I      | Ι            | Y             |               | V      |   | T            | Ε            | H  | S | L  | H            | .20      |
| 31 | 48  | ]             |        | 7   | I      | V      | R            |               | E             | H      | s | L            | H            | E  | P | M  | Y            | 20       |
| 32 | 58  | F             |        | Ξ   | Ρ      | M      |              |               | F             | L      | C | M            | L            | s  | G | I  | D            | 20       |
| 33 | 62  | 2             |        | [   | F      | L      | C            |               |               | _      | G |              | D            | I  | Г | I  | S            | 20       |
| 34 | 65  | I             | _      | 2   | M      | L      | _            |               |               |        |   |              | I            | S  | T |    | S            | 20<br>20 |
| 35 | 71  | ו             | . I    | )   | Ι      | L      | I            | S             | Т             | S      | S | M            | P            | K  | M |    | A            | 20       |
|    |     |               |        |     |        |        |              |               |               |        |   |              |              |    | • | 41 |              |          |

HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

| τ  | os  |   |     |   |    |        |     |     |   |     |     |     |     |        |     |   |        | ٠ | •      | score |
|----|-----|---|-----|---|----|--------|-----|-----|---|-----|-----|-----|-----|--------|-----|---|--------|---|--------|-------|
| F  | OS  | 1 | 2   | 3 | 4  | 5      | 5 ( | 5   | 7 | 8   | 9   | 0   | 1   | 2      |     |   | 4      | 5 |        | 0.0   |
| 36 | 80  | M | Р   | K | M  | Ι      |     | A : | Ι | F   | W   | F   | N   | S      |     |   | Т      | Ι |        | 20    |
| 37 | 81  | P | K   | M | L  | I      | 1   | I : | F | W   | F   | N   | S   | Т      |     | Г | I      | Q |        | 20    |
| 38 | 91  | S | Т   | T | I  | ζ      | ) : | F   | D | Α   | C   | L   | L   | Ç      |     | Ι | F      | A |        | 20    |
| 39 | 97  | D | Α   | С | L  | I      | ٠ ( | Q   | I | F   | Α   | Ι   | Н   | S      |     | L | S      | G |        | 20    |
| 40 | 98  | Α | С   | Ь | L  | (      | 2   | I   | F | Α   | I   | Η   | S   | L      | . : | S | G      | M |        | 20    |
| 41 | 100 | L | L   | Q | I  | . 1    | ₹.  | A   | I | Н   | S   | L   | S   | G      | ;   | M | Е      | S |        | 20    |
| 42 | 103 | I | F   | Α | I  | : I    | I   | S   | L | S   | G   | M   | E   | S      |     | Т | V      | L | ı      | 20    |
| 43 | 106 | I | Н   | S | I  | . :    | 3   | G   | M | E   | s   | Т   | V   | 1      | ,   | L | A      | Μ | l      | 20    |
| 44 | 115 | т | V   | L | I  | . 2    | 4   | M   | A | F   | D   | R   | Y   | Ţ      | ,   | Α | I      | C | !      | 20    |
| 45 | 117 | L | L   | Α | M  | 1      | A   | F   | D | R   | Y   | v   | Α   | ]      | -   | C | Н      | P | •      | 20    |
|    | 125 | Y | V   | Α | 1  | : (    | С   | н   | P | L   | R   | Н   | Α   | J      | •   | V | L      | Т | •      | 20    |
|    | 129 | С | Н   | P | I  | . ]    | R   | н   | A | т   | v   | L   | Т   | Ι      | ر   | Ρ | R      | V | 7      | 20    |
|    | 137 | v | L   | Т | I  |        | P   | R   | v | т   | ĸ   | Ι   | G   | 7      | 7   | A | A      | V | 7      | 20    |
|    | 140 | L | Р   | R | 7  | , ,    | Т   | ĸ   | I | G   | v   | Α   | Α   | 7      | 7   | V | R      | G | ;      | 20    |
|    | 155 | A | A   | L | N  | 1      | A   | P   | L | Р   | v   | F   | Ι   | F      | C   | Q | L      | F | )      | 20    |
|    | 162 | P | V   | F | ]  | Ε :    | K   | Q   | L | Р   | F   | С   | R   | 5      | 3   | N | I      | I | ,      | 20    |
|    | 165 | I | K   | _ |    |        | P   | F   | С | R   | s   | N   | I   | ]      |     | s | Н      | 2 | ;      | 20    |
|    | 179 | s | Y   | Ĉ |    |        | H   | Q   | D | v   | м   | K   | L   | 7      | ¥   | С | D      | Ī | )      | 20    |
|    | 183 | н | Ô   | D |    |        | M   | ĸ   | L | A   | C   | D   | D   | -      | I.  | R | V      | N | 1      | 20    |
| 55 | 186 | v | M   |   |    |        | A   | C   | D | D   | I   | R   | V   | . 1    | Ţ   | v | V      | 7 | 7      | 20    |
| 56 | 193 | D | I   | R |    |        | N   | v   | v | Y   | G   | L   | I   |        | J   | I | Ι      | 2 | 3      | 20    |
| 57 | 196 | v | N   |   |    |        | Y   | G   | L | I   | v   | I   | I   |        | 3   | Α | 1      | C | 3      | 20    |
| 58 | 199 | v | Y   |   |    | ·<br>L | I   | v   | I | I   | s   | A   | I   |        | 3   | L | D      | 5 | 3      | 20    |
| 59 | 200 | Y | G   |   |    |        | v   | I   | I | s   | A   | I   | G   |        | L.  | D | s      |   |        | 20    |
| 60 | 202 | L | I   |   |    | I      | I   | s   | A | I   | G   | Ь   |     |        | s   | L | L      | 1 | Ľ      | 20    |
| 61 | 202 | I | v   |   |    | I      | s   | A   | ï | G   | L   | D   |     |        | L   | L | I      |   | 3      | 20    |
| 62 | 206 | I | S   |   |    | ľ      | G   | L   | D | s   | L   | L   |     |        | S   | F | S      |   | Y      | 20    |
| 63 | 208 | A |     |   |    |        | D   | s   | L | L   | I   | s   |     |        | s   | Y | L      |   | L,     | 20    |
| 64 | 211 | L |     |   |    | L      | L   | I   | s | F   | s   | Y   |     |        | L   | I | L      |   | K      | 20    |
| 65 | 211 | D |     |   |    | L      | I   | s   | F | s   | Y   | L   |     |        | I   | L | K      |   | Г      | 20    |
| 66 | 218 | F |     |   |    | L      | L   | I   | L | K   | T   | v   |     |        | G   | L | Т      |   | R      | 20    |
| 67 | 240 | G |     |   |    | v      | s   | H   | v | C   | A   | V   |     |        | I   | F | Y      |   | V      | 20    |
| 68 | 243 | v |     |   |    | v      | C   | A   | v | F   | I   | F   |     |        | v   | P | F      |   | Ι      | 20    |
| 69 | 243 | v |     |   |    | v      | F   | I   | F | Y   | v   |     |     | 7      | I   | G |        |   | s      | 20    |
| 70 | 248 | A |     |   |    | ĭ      | F   | Y   | v | P   | F   |     |     |        | L   | s |        |   | v      | 20    |
| 71 | 251 | I |     |   |    | v      | P   | F   | ĭ | Ğ   |     |     |     |        | v   | Н |        |   | F      | 20    |
| 72 | 272 | P |     |   |    | v      | Ι   | L   | A | N   | I   |     |     |        | L   | v |        |   | P      | 20    |
| 73 | 277 | I |     |   |    | I      | Y   | L   | L | V   |     |     |     | -<br>J | L   | N |        |   | I      | 20    |
| 74 | 285 | F |     | - |    | L      | N   | P   | I | v   |     |     |     | J      | ĸ   | Т |        |   | E      | 20    |
|    |     | _ | 1   |   |    |        | L   | E   |   |     | . Q |     | , 1 |        | L   | Ā |        | _ | P      | 18    |
| 75 | 18  |   |     |   |    | A      | F   | P   | L |     |     |     |     | Y      | L   | I |        |   | v      | 18    |
| 76 | 27  | F |     |   |    |        |     | L   |   |     |     |     |     | 5      | М   | P |        | Ċ |        | 18    |
| 77 | 69  | 5 |     |   |    | D      | I   |     |   |     |     |     |     | F      | A   | I |        |   | s      | 18    |
| 78 | 94  | 1 |     | _ |    | D      | A   |     |   |     |     |     |     | c<br>L | S   | G |        |   | E      | 18    |
| 79 | 99  |   |     |   |    | Q      | I   | F   |   |     |     |     |     | L<br>L | L   |   |        |   | A      |       |
| 80 | 107 | ŀ |     |   | Ĺ, | S      | G   |     |   |     |     |     |     |        | А   |   |        |   | Н      |       |
| 81 | 116 | 7 |     |   |    |        | M   |     |   |     |     |     |     | V      |     |   |        | ŗ | L      |       |
| 82 | 126 | 7 |     |   | I  | C      | H   |     |   |     |     |     |     | T      | V   |   |        |   |        |       |
| 83 | 164 | I |     |   | K  |        | L   |     |   |     |     |     |     | N      | I   | I | <br>[] |   | H<br>7 |       |
| 84 | 176 | I | . : | 5 | H  | S      | Y   | С   | L | . H | Ç   | ۱ ي | )   | V      | M   |   |        |   | A      | . 18  |
|    |     |   |     |   |    |        |     |     |   |     |     |     |     |        |     |   | 42     | _ |        |       |

HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

| P          | os         | 1      | 2   | 3 | 4      | 5      | 6   | 5 7 | 7 8 | 3 9 | 9 ( | О        | 1   | 2 | 3  | 4 | 5      | 5 | score |            |
|------------|------------|--------|-----|---|--------|--------|-----|-----|-----|-----|-----|----------|-----|---|----|---|--------|---|-------|------------|
| 85         | 187        | M      | K   | L | Α      | . C    | : E | ) [ | )   | [ ] | ٦.  | <b>7</b> | N   | V | ٧  | Y | C      | 3 | 18    | 3          |
| -          | 205        | I      | Ι   | s | A      | . 1    |     | ; 1 | ו ב | 2 5 | 3 : | L        | L   | Ι | s  | F | ٤      | 3 | 18    | }          |
|            | 233        | E      | Α   | Q | А      | . K    |     | . 1 | e ( | 3 : | r   | C        | V   | S | Н  | V | C      | 7 | 18    | 3          |
|            | 237        | ĸ      | Α   | F | G      |        |     | : 1 | 7 5 | 3 1 | H . | V        | С   | Α | V  | F | ]      | ľ | 18    | 3          |
| 89         | 271        | s      | P   | L | P      |        |     |     |     | A 1 | N   | I        | Y   | L | L  | V | Į      | Б | 18    | 3          |
| 90         | 293        | Y      | G   | v | ĸ      |        |     |     |     |     |     |          | R   | Ι | L  | R | 1      | ւ | 18    | 3          |
| 91         | 294        | G      | V   | ĸ | T      |        |     |     |     |     |     | R        | I   | L | R  | L | 1      | F | 18    | 3          |
| 92         | 10         | s      | A   | Т | Y      |        |     |     |     |     |     | L        | P   | G | L  | E | ]      | Е | 16    | 5          |
| 93         | 28         | W      | L   | Ā | E      |        |     |     |     |     |     | Y        | L   | Ι | Α  | v | . ]    | L | 16    | 5          |
| 94         | 59         | E      | P   | М | Y      |        |     |     |     |     |     | L        | s   | G | Ι  | D | , ;    | I | 16    | 5          |
| 95         | 61         | М      | Y   | Ι | E      |        |     |     |     |     |     | G        | Ι   | D | I  | L | , :    | I | 16    | 5          |
| 96         | 85         | A      | I   | F | V      |        |     |     |     |     | T   | I        | Q   | F | D  | A | . (    | C | 16    | 6          |
| 97         | 101        | L      | ō   | I | I      |        |     |     |     |     | L   | s        | Ĝ   | М | Е  | S | ; '    | т | 16    | 6          |
|            | 177        | S      | Н   | s |        |        |     |     |     |     | D   | V        | M   | K | L  |   |        | С | 10    | 6          |
| 98         |            | A      | K   | A |        |        |     |     |     | V   | s   | H        | v   | С | Α  |   |        | F | 10    | 6          |
| 99         | 236        | v      | F   | I |        |        |     |     | P   | F   | I   | G        | L   | s | M  |   | 7      | Н | 1     | 6          |
| 100        | 249        | Y      | V   | P |        |        |     |     | L   |     | M   | v        | Н   | R | F  |   |        | K | 1     | 6          |
| 101<br>102 | 253<br>13  | Y      | F   | I |        |        |     | G   | L   | P   | G   | L        | E   | E | A  |   |        | F | 1.    | 4          |
| 102        |            | F      | I   | L |        |        |     | L   | P   | G   | L   | E        | E   | A |    |   |        | W | 1     | 4          |
|            | 14         | L      | I   | G |        |        |     | G   | L   | E   | E   | A        | Q   | F | Į. | • |        | Α | 1     | 4          |
| 104        | 16<br>38   | L      | I   | P |        |        |     | G   | N   | ь   | T   | Ι        | I   | Y |    |   |        | R | 1     | 4          |
| 105        | 30<br>47   | I      | I   |   |        |        |     | R   | T   | E   | H   | s        | L   | Н |    |   | •      | М | 1     | 4          |
| 106        |            | E      | Н   |   |        |        |     | E   | P   | M   | Y   | I        | F   | L |    |   | 4      | L | 1     | 4          |
| 107        | 54         | P      | М   |   |        | I      | F   | L   | C   | M   | L   | s        | G   | I |    |   | Ī      | L | 1     | 4          |
| 108        | 60<br>64   |        | L   |   |        | M      | L   | s   | G   | I   | D   | I        | L   | I |    |   | -<br>Г | S | 1     | 4          |
| 109        | 64         | F<br>G |     |   |        | I      | L   | I   | S   | T   | s   | s        | M   |   |    |   | M.     | L |       | 4          |
| 110        | 70         | D      |     |   |        | I      | S   | T   | s   | s   | м   | P        | K   |   |    |   | Ā      | I |       | 4          |
| 111        | 72         | L      |     |   |        | M      | E   | s   | T   | v   | L   | L        | A   |   |    |   | F      | D | 1     | .4         |
| 112        | 109        | E      |     |   |        | V      | L   | L   | A   | M   | A   | F        | D   |   |    |   | V      | Α |       | .4         |
| 113        | 113        | A.     |     |   |        | L      | Т   | L   | P   | R   | v   | T        |     |   |    |   | V      | A |       | .4         |
| 114        | 135        | v      |     |   | v<br>K | I      | G   | v   | A   | Α   | v   | v        |     |   |    |   | A      | L |       | 4          |
| 115        | 143        | v      |     |   | A      | v      | V   | R   | G   | A   | A   | L        |     |   |    |   | L      | P |       | 4          |
| 116        | 148        | ZA     |     |   | V      | v      | R   | G   | A   | A   | L   | М        |     |   |    |   | P      | V | 1     | L <b>4</b> |
| 117        | 149        | G      |     |   | v<br>A | L      | M   | A   | P   | L   | P   | v        |     |   |    |   | Q      | L | 1     | L 4        |
| 118        | 154        | M      |     |   | P.     | ь      | P   | v   | F   | I   | ĸ   | Q        |     |   |    |   | Ĉ      | R |       | L 4        |
| 119        | 158        | 5      |     |   | I      | L      | S   | н   | s   | Y   | C   | L        |     |   |    |   | v      | М |       | 14         |
| 120        | 173        | Ç      |     |   | V      | м      | K   | L   | A   | Ċ   | D   | D        |     |   |    |   | N      | V |       | 14         |
| 121        | 184<br>191 | ,      | _   |   | D      | I      | R   | v   | N   | V   | v   |          |     |   |    | Ι | v      | Ι | -     | 14         |
| 122        |            | F      |     |   | N      | v      | V   | Y   | G   | L   | I   | v        |     |   |    | S | Α      | Ι |       | 14         |
| 123        | 195        |        | 3 ] |   |        |        |     | F   |     | Y   |     |          |     |   |    | K |        |   | _     | 14         |
| 124        |            |        | [ ] |   | L      | ī      | L   | K   |     |     |     |          |     |   |    | R | E      |   | _     | 14         |
| 125        |            |        |     |   | I      | L      | K   |     |     |     |     |          |     |   |    | E | A      |   |       | 14         |
| 126        |            |        |     |   | V      | ь      | G   |     |     |     |     |          |     |   |    | K |        |   | •     | 14         |
| 127        |            |        |     |   |        |        | Н   |     |     |     |     |          |     | _ | D  | S | P      |   |       | 14         |
| 128        |            |        |     |   |        | V<br>T | P   |     |     |     |     |          |     |   | Y  | L | L      |   |       | 14         |
| 129        |            |        |     |   | P      | L      | L   |     | . N |     |     |          |     |   | v  | P | P      |   |       | 14         |
| 130        |            |        |     | P |        | L      |     | N   |     |     |     |          |     |   | P  | P | v      |   |       | 14         |
| 131        |            |        |     | V | I      | r<br>r |     |     |     |     | ' I |          |     |   | I  | V | Y      |   |       | 14         |
| 132        |            |        |     | Y | Ъ      |        |     |     | P   |     |     |          |     | G |    | ĸ |        |   |       | 14         |
| 133        | 284        | ,      | V   | ۲ | Ľ      | ٧      | ш   | TA  |     | 1   | . ` |          | • ' | _ | ٠  |   | 13     |   | -     |            |
|            |            |        |     |   |        |        |     |     |     |     |     |          |     |   |    | - | ני     |   |       |            |

HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

Pos 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 8 core 134 302 Q R I L R L F H V A T H A S E 14

HLA-DRB1\*1101 15-mers
(SEQ ID NOS 2806-2866, respectively
in order of appearance)

|          | Pos       | 1      | 2 | 3            | 4 | 5      | 6      | 7            | 8            | 9 | 0      | 1      | 2      | 3            | 4   | 5      | score    |
|----------|-----------|--------|---|--------------|---|--------|--------|--------------|--------------|---|--------|--------|--------|--------------|-----|--------|----------|
| 1        | 145       | ĸ      | I | G            | v | A      | A      | v            | V            | R | G      | A      | A      | ь            | M   | A      | 28       |
| 2        | 122       | F      | D | R            | Y | V      | Α      | I            | C            | Н | P      | L      | R      | Н            | A   | Т      | 25       |
| 3        | 217       | s      | F | S            | Y | L      | L      | ī            | L            | ĸ | Т      | v      | L      | G            | L   | T      | 25       |
| 4        | 197       | И      | V | V            | Y | G      | L      | ī            | V            | I | I      | s      | A      | I            | G   | L      | 24       |
| 5        | 10        | S      | A | T            | Y | F      | I      | L            | I            | G | L      | P      | G      | L            | E   | E      | 23       |
| 6        | 255       | P      | F | I            | G | L      | s      | M            | v            | н | R      | F      | S      | ĸ            | R   | R      | 23       |
| 7        | 44        | N      | L | T            | I | I      | Y      | I            | v            | R | T      | Ē      | Н      | s            | L   | Н      | 22       |
| 8        | 59        | E      | P | М            | Y | I      | F      | L            | C            | M | L      | s      | G      | I            | D   | I      | 22       |
| 9        | 158       | М      | Α | P            | L | P      | v      | F            | I            | ĸ | Q      | L      | Р      | F            | С   | R      | 22       |
| 10       | 237       | K      | Α | F            | G | т      | С      | v            | s            | н | v      | С      | A      | ٧            | F   | I      | 22       |
| 11       | 74        | L      | I | s            | т | s      | s      | М            | P            | K | M      | L      | A      | Ι            | F   | W      | 21       |
| 12       | 134       | н      | Α | Т            | v | L      | T      | L            | P            | R | v      | Т      | K      | Ι            | G   | V      | 20       |
| 13       | 137       | v      | L | T            | L | P      | R      | V            | Т            | ĸ | I      | G      | V      | A            | Α   | V      | 20       |
| 14       | 162       | P      | V | F            | I | K      | Q      | L            | P            | F | С      | R      | s      | N            | I   | L      | 20       |
| 15       | 199       | V      | Y | G            | L | 1      | v      | 1            | 1            | s | Α      | I      | G      | L            | D   | s      | 20       |
| 16       | 224       | L      | K | $\mathbf{T}$ | v | L      | G      | L            | $\mathbf{T}$ | R | E      | A      | Q      | Α            | K   | Α      | 20       |
| 17       | 256       | F      | 1 | G            | L | s      | M      | V            | Н            | R | F      | s      | K      | R            | R   | D      | 20       |
| 18       | 290       | P      | I | V            | Y | G      | V      | K            | $\mathbf{T}$ | K | E      | I      | R      | Q            | R   | Ι      | 20       |
| 19       | 301       | R      | Q | R            | I | L      | R      | L            | F            | H | V      | A      | Т      | H            | Α   | S      | 20       |
| 20       | 65        | L      | C | M            | L | S      | G      | I            | D            | I | L      | I      | S      | $\mathbf{T}$ | s   | S      | 19       |
| 21       | 100       | L      | L | Q            | I | F      | A      | 1            | Н            | S | L      | S      | G      | M            | E   | S      | 19       |
| 22       | 196       | V      | И | V            | V | Y      | G      | L            | 1            | v | Ι      | I      | S      | A            | 1   | G      | 19       |
| 23       | 218       | F      | S | Y            | L | L      | I      | $\mathbf{L}$ | K            | т | V      | L      | G      | L            | Т   | R      | 19       |
| 24       | 247       | C      | A | V            | F | 1      | F      | Y            | V            | P | F      | I      | G      | L            | S   | M      | 19       |
| 25       | 274       | P      | V | I            | Г | A      | N      | I            | Y            | L | L      | V      | P      | P            | V   | L      | 19       |
| 26       | 45        | L      | T | Ι            | Ι | Y      | I      | V            | R            | T | Е      | H      | S      | L            | Н   | E      | 18       |
| 27       | 68        | L      | S | G            | I | D      | I      | L            | I            | S | T      | S      | S      | M            | Þ   | K      | 18       |
| 28       | 80        | M      | P | K            | M | L      | A      | I            | F            | W | F      | N      | S      | T            | T   | Ι      | 18       |
| 29       | 97        | Δ_     | A | C            | L | L      | Q      | Ι            | F            | A | I      | H      | S      | L            | S   | G      | 18       |
| 30       | 103       | I      | F | A            | I | Н      | S      | L            | S            | G | M      | Ξ      | S      | T            | V   | L      | 18       |
| 31       | 208       | A      | I | G            | L | D      | S      | L            | L            | I | S      | F      | S      | Y            | L   | L      | 18       |
| 32<br>33 | 249       | V      | F | I            | F | Y      | V<br>C | P            | F            | I | G<br>G | L      | S      | M            | V   | H      | 18       |
| 34       | 61<br>215 | M<br>L | Y | S            | F | L<br>S | Y      | M<br>L       | L<br>L       | S | L      | I      | D<br>T | I<br>V       | L   | I      | 17       |
| 35       | 259       | L      | S | M            | v | Н      | R      | F            | S            | K | R      | K<br>R | D      | s            | Ъ   | G<br>L | 17<br>17 |
| 36       | 278       | A      | N | I            | Y | L      | L      | V            | P            | P | V      | L      | N      | P            | I   | V      | 17       |
| 37       | 288       | L      | N | P            | I | V      | Y      | G            | V            | K | T      | K      | E      | I            | R   | Q      | 17       |
| 38       | 11        | A      | Т | Y            | F | I      | L      | I            | G            | L | p      | G      | L      | E            | E   | A      | 16       |
| 39       | 24        | E      | A | ō            | F | W      | L      | A            | F            | P | L      | С      | S      | L            | У   | L      | 16       |
| 40       | 42        | L      | G | И            | L | Т      | I      | I            | Y            | I | V      | R      | T      | E            | Н   | S      | 16       |
| 41       | 253       | Y      | V | P            | F | I      | G      | L            | S            | м | v      | Н      | R      | F            | S   | K      | 16       |
| 42       | 47        | I      | I | Y            | I | v      | R      | T            | E            | Н | s      | L      | Н      | E            | P   | М      | 15       |
|          | * '       | _      | - | ~            | _ | •      | -      | •            | ~            |   | ~      |        | ••     |              | 14  |        | 1.0      |
|          |           |        |   |              |   |        |        |              |              |   |        |        |        | _            | . г |        |          |

HLA-DRB1\*1101 15-mers (SEQ ID NOS 2806-2866, respectively in order of appearance)

|    | Pos |   | _            | _ |   | _            | _ | - | _ | _ | ^ | 1 | 2 | 3 | 4 | 5 | score |
|----|-----|---|--------------|---|---|--------------|---|---|---|---|---|---|---|---|---|---|-------|
|    |     | 1 | 2            | 3 | 4 | 5            | 6 | 7 | 8 | 9 | 0 | _ | _ | - |   | _ |       |
| 43 | 99  | С | L            | L | Q | 1            | F | A | Ι | H | S | L | S | G | M | E | 15    |
| 44 | 116 | V | L            | L | A | М            | A | F | D | R | Y | V | A | Ι | С | H | 15    |
| 45 | 143 | ٧ | $\mathbf{T}$ | K | I | G            | v | Α | Α | V | V | R | G | A | Α | L | 15    |
| 46 | 179 | S | Y            | С | L | Н            | Q | D | V | M | K | L | A | С | D | D | 1.5   |
| 47 | 227 | v | L            | G | L | $\mathbf{T}$ | R | E | Α | Q | A | K | А | F | G | Т | 15    |
| 48 | 260 | s | М            | V | H | R            | F | S | K | R | R | D | S | Р | L | P | 15    |
| 49 | 261 | M | V            | Н | R | F            | s | K | R | R | D | S | P | L | P | V | 15    |
| 50 | 277 | L | Α            | N | I | Y            | L | L | V | P | P | V | L | N | Р | Ι | 15    |
| 51 | 285 | P | P            | V | L | И            | P | I | V | Y | G | V | K | Т | K | E | 15    |
| 52 | 114 | S | Т            | V | L | L            | Α | М | Α | F | D | R | Y | V | Α | I | 14    |
| 53 | 125 | Y | V            | Α | I | C            | H | P | L | R | Н | Α | Т | V | L | Т | 14    |
| 54 | 126 | v | Α            | I | C | H            | P | L | R | H | А | Т | V | L | Т | L | 14    |
| 55 | 140 | L | P            | R | v | Т            | K | Ι | G | v | Α | Α | V | V | R | G | 14    |
| 56 | 170 | F | C            | R | S | И            | I | L | S | H | S | Y | С | L | Н | Q | 14    |
| 57 | 180 | Y | С            | L | H | Q            | D | V | Μ | K | L | Α | С | D | D | I | 14    |
| 58 | 193 | D | I            | R | V | N            | v | V | Y | G | L | I | V | I | I | S | 14    |
| 59 | 229 | G | L            | Т | R | Е            | A | Q | Α | K | Α | F | G | Т | С | V | 14    |
| 60 | 270 | D | s            | Р | L | P            | v | I | L | A | N | I | Y | L | L | V | 14    |
| 61 | 298 | K | E            | I | R | Q            | R | 1 | L | R | L | F | H | V | Α | Т | 14    |
|    |     |   |              |   |   |              |   |   |   |   |   |   |   |   |   |   |       |

Please replace Table XXIX, beginning at page 213, line 1, with the following rewritten Table XXIX:

### -- Table XXIX. Nucleotide sequence in the 5' region close to 101P3A11 gene (SEQ ID NO: 2867).

| ).   |              |            |             |                |              |            |
|------|--------------|------------|-------------|----------------|--------------|------------|
|      | 1 TGCGCTCCAC | CAAGCCTGG  | C TAACTTTTG | C ATTTTTAATA   | A GAGGCAGGG' | TTCACCATGT |
| 61   | TGGCCTGGCT   | GGTCTCGAAC | CCCTGACCTT  | GCGATCTGCC     | CACCTCGGCC   | TCCCAAAGTG |
| 121  | CTGGGATTAC   | AGGCGTGAGC | CACTGTACCT  | 000000-        | ATTGTTTTTT   |            |
| 181  | CCAAAACCTT   | GCCCTGGCAA | TTCTGATTTT  | C100000100     | AGCAGGACCT   |            |
| 241  | TGTTGTCAAT   | TACTTTAGAT | GTTTCTATCA  | GGAAAGTTTG     | AGAAATGGTA   |            |
| 301  | AACACAAACC   | TCTCTTGAAA | TCTCATCCCA  | GACTGAGCCC     | CTGCTCCCTA   | TCTTAAATTA |
| 361  | GATTATAGTA   | GGTCTTAAAG | TCAGCTGTAG  | ACTGAGCCTC     | TAAATCTGAA   | CCCAGACCCA |
| 421  | CCCTAACCCC   | AGGATACATC | AGAAGAGCTG  | GTCAATGTGG     | ACCATTCTGA   | GCAATCCTGC |
| 481  | AAGTCTACTC   |            | AGGCTAAGAG  | CAGTGCCCTG     | GGCAGCAACA   | TCAGCTCTGA |
| 541  |              |            | TGTTTTATGA  | GTGGGTCTTC     | ACACACTGAG   | ATTCATGGGA |
| 601  |              |            | GCAGCACTGG  |                | GGTCAGGGTA   | AGGCTCAAGA |
| 661  |              |            | AGGAGAATCA  |                | AGACTAGGGT   | TCAGAATTAC |
| 721  | CAGGATGACT   | TAGTCCTGTT |             | ACCACTCCAA     | TGCCTTTTCC   | TCATTAGTCC |
| 781  | TTTCTCTCCCT  |            | ACTAAATGAT  | GTTTCTACTT     | TTCCCTTTCT   | ACTTTCCTAG |
| 841  | ACCCTGGATT   | TTGTATGCAG | AAGCCCCAGC  | TCTTGGTCCC     | TATCATAGCC   | ACTTCAAATG |
| 901  | GAAATCTGGT   |            |             |                | CCCTGGCCTG   |            |
| 201  | TACACTTTTG   | GCTGGCTTTC |             |                | CTTGGCCACC   |            |
| 961  | TGACCATTGT   | CCTCATCATT |             |                | TGAGCCCATG   |            |
| 1021 | 101100111    | TTCCACTATT |             |                |              | AAGATGGCCA |
| 1081 | TGGCCATGCT   |            |             | <del>-</del> · | TTGCCTGGCC   | CAGATGTTCC |
| 1141 | GTCTTTTCCT   |            |             |                |              |            |
| 1201 | TTATCCATGC   | TCTGTCAGCC | GTGGAGTCAG  | CIGICCIGCI     | CCCATCOCT    |            |

|  |   |  | mmaaaaaa ma   | ammamamaam   | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~  |   |
|--|---|--|---|--|--|---|
|  | TTGTGGCCAT  |  |   |  |  |   |
|  | AGATTGGACT  |  |   |  |  |   |
|  | TCAAGTGGTT  |  |   |  |  |   |
|  | ATATTATGAA  |  |   |  |  |   |
|  | TCCTCTCAGT  |  |   |  |  |   |
|  | GGGCTGTTTT  |  |   |  |  |   |
|  | CCCACCTCTG  |  |   |  |  |   |
|  | GGCTGGGTGG  |  |   |  |  |   |
|  | CACCTGTAGT  |  |   |  |  |   |
|  | TCTGTATGTT  |  |   |  |  |   |
| 1861   | ACAGAAGATG  | GGAATATTAG   | GATCCTATTG  | AATGCCTTGG   | TGATTAAAGT   | ATCAAACCTA  |
| 1921   | TTGTGCTGTC  | TTCTTCCAGC   | AATTTAAGTA  | GATCATGTAT   | TCTGTCTCCA   | GGAATGTGTC  |
| 1981   | AGTACTGAAC  | TTATGACCCT   | GTCTGGACAT  | CCTGGAGAAT   | GACTGCACTA   | GTCCCTCTGC  |
| 2041   | TATGGTGGTC  | TTGCCTTCTC   | CTTCTCTCTC  | AGCTAGAAAA   | TACATCTAGT   | TTTGACATGG  |
| 2101   | GGAGGCTGTA  | AAGATCACAC   | ${\tt CTCATGGTTC}$  | ATTCCAGTTT   | TGAAGTATGA   | TTTTAATGTT  |
| 2161   | CTTGCCCCCA  | TGTGCCCATG   | ${\tt TTGGTGAATT}$  | TGCATGGACT   | ATAAACGTTA   | TTGCAAATAC  |
| 2221   | CCTAAAGTGG  | TTACCCAGCC   | ${\tt ATAATCAGGG}$  | ${\tt GTTAATGAAG}$   | ${\tt GTATTTGGGG}$   | AATAGTAACT  |
| 2281   | GGAGAGACAG  | CAACAAGACA   | AGAGGCAGCT  | CACATGCAAT   | ${\tt GTTGAAGTTT}$   | CTGTATGCAA  |
| 2341   | GAGGGTGTGT  | TGGCAGATTT   | ${\tt GTGAAATCTG}$  | CCCATTTGCA   | TCTGTATGGC   | TCTATATGAC  |
| 2401   | TATTTGTCCA  | TAAGGGTGCC   | ATGTATTCTG  | GTTGTGGGTG   | ${\tt TGAATGTGTG}$   | GGTGTGTTTA  |
| 2461   | TGTGGACACT  | TGCTTTTCAG   | TGTGCGTATA  | TGTGAGAGAG   | AGGGTGCACA   | CATGGAATAC  |
| 2521   | GTACTGGTTG  | TGTCCTGGTG   | AGTGTGGTAG  | CTATGTCCTG   | GCACATGTAT   | GTTTCATGAG  |
| 2581   | ACGTGTCTCT  | GATTGCGCAT   | TTGTATTTCT  | GTGGTATCTG   | TTAGTTGGTA   | TATGATATGT  |
| 2641   | GTCTACGTGA  | GAATGCTGGT   | GTCTGTATCT  | GCATGGTGGG   | CAGTACCTTT   | ATGTGTATCT  |
| 2701   | GGTAAGAATG  | CTGCCTCTAC   | CTTTTCTTCC  | TATTTGTACT   | ATGTGAATGT   | GGTGCATGAA  |
| 2761   | TGTGTGGAAT  | GTGTGGAATG   | TGTAGTATTG  | GGATGCCTGT   | ATCTTTCAGC   | GTGTTTGGGT  |
|  | GTATGTCCAC  |  |   |  |  |   |
| 2881   | TAGTTGTAAG  | TCGGTGAAAT   | GTACATCTGA  | ATTCTGTGTG   | CATATTGTTG   | GTACTGATGC  |
| 2941   | TATTTTCGTG  | CATATGTCTA   | GTGTATATGT  | TTTAAGGCAA   | ACTTTCTTTG   | TGTGTTGGGT  |
|  | = -   |  | a. a. aa. mam   | ביים אי שימיים ביים א  | CCA TCCA TTTC  | A TOTOTOTO COTO   |
| 3001   | GTGTATGTGA  | CACGAATGGG   | GACAGCATCT  | GIALLICIGA   | GCAIGGAIIG   | DIDDIDIDIA  |
|  | GTGTATGTGA<br>TCTGTATGTA  |  |   |  |  |   |
| 3061   | TCTGTATGTA  | TCTTGGAATG   | GAGGAGGGAG  | ATTGAAGAAG   | TCTGGCTGTG   | AGCAGCAGAA  |
| 3061<br>3121   | TCTGTATGTA<br>ATAATTTCCA  | TCTTGGAATG<br>AAGTTGAGTG   | GAGGAGGGAG<br>ACATGACTCT  | ATTGAAGAAG<br>AAGATGCCCA   | TCTGGCTGTG<br>GTTTCTCGGC   | AGCAGCAGAA<br>CTGGGGTCAG  |
| 3061<br>3121<br>3181   | TCTGTATGTA<br>ATAATTTCCA<br>CCTGGGTGAT  | TCTTGGAATG<br>AAGTTGAGTG<br>AGCTCAGTCT   | GAGGAGGGAG<br>ACATGACTCT<br>GTCAGAATGA  | ATTGAAGAAG<br>AAGATGCCCA<br>AAGGAAACAC   | TCTGGCTGTG<br>GTTTCTCGGC<br>GGTGCTTCCT   | AGCAGCAGAA<br>CTGGGGTCAG<br>TGCTCCACCT  |
| 3061<br>3121<br>3181<br>3241   | TCTGTATGTA<br>ATAATTTCCA<br>CCTGGGTGAT<br>TTTCACAGGC  | TCTTGGAATG<br>AAGTTGAGTG<br>AGCTCAGTCT<br>CAGACCACAC   | GAGGAGGGAG<br>ACATGACTCT<br>GTCAGAATGA<br>CTTCTTCATC  | ATTGAAGAAG<br>AAGATGCCCA<br>AAGGAAACAC<br>CTGAACACAA   | TCTGGCTGTG<br>GTTTCTCGGC<br>GGTGCTTCCT<br>GGATTTCAAG   | AGCAGCAGAA<br>CTGGGGTCAG<br>TGCTCCACCT<br>GGCTTTTGTT  |
| 3061<br>3121<br>3181<br>3241<br>3301   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG   | GAGGAGGAG<br>ACATGACTCT<br>GTCAGAATGA<br>CTTCTTCATC<br>CCTCTGCTAT   | ATTGAAGAAG<br>AAGATGCCCA<br>AAGGAAACAC<br>CTGAACACAA<br>CCGAGGCACT   | TCTGGCTGTG<br>GTTTCTCGGC<br>GGTGCTTCCT<br>GGATTTCAAG<br>GGCCTCCCTA   | AGCAGCAGAA<br>CTGGGGTCAG<br>TGCTCCACCT<br>GGCTTTTGTT<br>AACCCTGCCC  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA   | TCTTGGAATG AAGTTGAGTCT AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCCTA TTCCCTTTTT  | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT  | TCTTGGAATG AAGTTGAGTCT AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCCC   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA   | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCCTA TTCCCTTTTT AAAATACAAC   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421<br>3481   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC   | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421<br>3481<br>3541   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA  | TCTTGGAATG AAGTTGAGTC AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC   | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC  | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421<br>3481<br>3541<br>3601   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG   | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAAA  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAAA  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421<br>3481<br>3541<br>3601<br>3661   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAAA  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAAA  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT  | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3361<br>3421<br>3481<br>3541<br>3601<br>3661<br>3721   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA   | TCTTGGAATG AAGTTGAGTC AGCTCAGCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAAA  | ATTGAAGAAG AAGATGCCCA AAGGAAACACA CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAAA   | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3601<br>3661<br>3721<br>3781   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAAA  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TTGTACTCC   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3601<br>3661<br>3721<br>3781<br>3841   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAG  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCCTTTGGT   | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGGAAGC CTGAAAAAAAC ACATGTCTCA GTCTTTGCCA  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TTGTTACTCC TGTCTAAGTT   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3841<br>3901   | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG   | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCCTTTGGT CAGAGATGCC  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGGAAGC CTGAAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG   | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTAGCATTC TGTTACTCC TGTCTAAGTT TGTCAGGCTG  | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGTT   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3601<br>3661<br>3721<br>3781<br>3841<br>3901<br>3961                                 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG AGGCACCAGA  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG TTGATGTGGT  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TTGTTACTCC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA  | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGTT ATGGTCTGTT  |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3841<br>3901<br>3961<br>4021                                 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG ATGGAGGCAGA TTGCCATGAT  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC CAGAGATGGC AACTGTTTAACA  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAA GACGTCTCCA GTCTTTGCCA TGATAGCAAG TTGATGTGCT TAGCGTGTCC   | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TTGTTACTCC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTCAGGCTG CTGAGTTAGA TGTGTTCTGA   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGTT ATGGTCTGTT ATGGTCTGTT ATGGTCTGTT ATGGTCTGTT   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3841<br>3901<br>4021<br>4081                                 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG ATGCACCAGA TTGCCATGAT CACAGTTGTG                                  | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC CTATTTAACA AAACTGATCA  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAA GACTCTCCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAGACC  | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TTGTTACTCC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTCAGGCTG AGCTTAGA TGTCAGGCTG AGCTTAGA TGTGTTCTGA AACTAAAAAC                | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGTT ATGTTGTTC |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3841<br>3901<br>3961<br>4021<br>4081<br>4141                 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG ATGGAGCAGA TTGCCATGAT CACAGTTGTG CACAGTTGTG TATTTATAGA            | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC CTATTTAACA AAACTGATCA TGTAGTTTT  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT GTAAAAAATA ACTTATTCA   | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAGCC AAATACGAGG                                    | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTAGCATTC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTCAGGCTG AGCTTGAGTT TGTCAGGCTG CTGAGTTAGA TGTGTTCTGA AACTAAAAAC TATTTAGTTT | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGTT ATGGTCTGTT ATGGTCTGTT ATGGTCTGAT ATTTAAAACT CATGTTGTTC TACATTCAAA   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3841<br>3901<br>4021<br>4081<br>4141<br>4201                 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAGA TTGCCATGAT CACAGTTGTG CACAGTTGTG TATTTATAGA TTGTTCTCTA           | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC CTATTTAACA AAACTGATCA TGTAGTTTTT ACTCTCTAAA                                  | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGATG AGGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT TAGCTTGATT GTAAAAATA ACTTATTCA                                  | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAGCC AAATACGAGG ACTATTTTG                          | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTAGCATTC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTGTTCTGA ACTAAAAAC TATTTAGTTT CCCTTAAGGG                                   | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGTT ATGGTCTGAT ATGTTAAAACT CATGTTGTTC TACATTCAAA AGAAACCAGA   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3781<br>3901<br>3961<br>4021<br>4081<br>4141<br>4201<br>4261         | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG ATGCACTGAT CACAGTTGTC TATTTATAGA TTGTTCTCTA TGTCATTGGT            | TCTTGGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTCTCA CAGAGATGGC AACTGTTGTC CTATTTAACA AAACTGATCA TGTAGTTTTT ACTCTCTAAA CTTACGTGGC                       | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT TAGCTTGATT GTAAAAATA ACTTATTCA ATGTTCTCTG TGGTGTTGGG             | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGAAGC CTGAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAGCC AAATACGAGG ACTATTTTG GGTGGGGAGG               | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTAGCATTC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTGTTCTGA ACTAAAAAC TATTTAGTTT CCCTTAAGGG GTTAAAGAAA                        | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGGTCTGAT ATGTTGAT ATGTTGAT ATGTTGAT ATTTAAAACT CATGTTGTTC TACATTCAAA AGAAACCAGA CCACGTTCTC                                       |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3841<br>3901<br>3961<br>4021<br>4081<br>4141<br>4201<br>4261<br>4321 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG TTGCCATGAT CACAGTTGTG TATTTATAGA TTGTTCTCTA TGTCATTGGT TGTCCTCAGC | AAGTTGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCAGAGATGGC AACTGTTGTC CTATTTAACA AACTGATCA TGTAGTTTTT ACTCTCTAAA CTTACGTGGC CAGAAGTTCA                       | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT GTAAAAATA ACTTATTTCA ATGTTCTCTG TGGTGTTCGG GTAATCCAAG            | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGGAAGC CTGAAAAAAAC ACATGTCTCA GTCTTTGCCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAGCC AAATACGAGG ACTATTTTTG GGTGGGGAGG GCCAGAGAGT | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTCAAGCTT TGTCAGGCTG CTGAGTTAGA TGTCTAAGTT CCTGAGTTCGA AACTAAAAAC TATTTAGTTT CCCTTAAGGG GTTAAAGAAA GGACGGCAGA          | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGTCTGAT ATTTAAAACT CATGTTGTC TACATTCAAA AGAAACCAGA CCACGTTCTC GGCACTGTCC   |
| 3061<br>3121<br>3181<br>3241<br>3301<br>3421<br>3481<br>3541<br>3661<br>3721<br>3841<br>3961<br>4021<br>4081<br>4141<br>4201<br>4261<br>4321<br>4381 | TCTGTATGTA ATAATTTCCA CCTGGGTGAT TTTCACAGGC ACCTCTTCCT TCCTGCCTCA CCAAACATGT GTGTGATGGC GAGCCCGCAA ACAGAGCAAG TCTCCTAATC GCCGCATGGA TCACCTTGTC GAAGTAGAAG ATGGAGGCAG ATGGAGGCAG ATGCATGAT CACAGTTGTG TATTTATAGA TTGTCATTGGT TGTCCTCAGC CTGGGGACCT | AAGTTGAATG AAGTTGAGTG AGCTCAGTCT CAGACCACAC ACGTTTCCTG ATAGCAAGTC ATAAAAGTCC GCGTGCCTGT GGTGGAGGTT ACTCTGTGTC CCTCTGGGAA AACTCCCTTA TCATGTCTCA TCATGTTGTC CAGAGATGGC AACTGTTGTC CTATTTAACA AAACTGATCA TGTAGTTTTT ACTCTCTAAA CTTACGTGGC CAGAAGTTCA TGGTTATAAG | GAGGAGGAG ACATGACTCT GTCAGAATGA CTTCTTCATC CCTCTGCTAT ATGGTATCCT TTGGTTCCCC AGTCCCAGCT GCAGTGAGCC AAAAAAAAA AGCAAGGGTG AGCAGGAAG CTGTCCTTCC ATTTTTAAA TCCAGGGTTC ACCAGTAATT TAGCTTGATT GTAAAAATA ACTTATTTCA ATGTTCTCTG TGGTGTTCGG GTAATCCAAG TTATCCAGAC | ATTGAAGAAG AAGATGCCCA AAGGAAACAC CTGAACACAA CCGAGGCACT CACCTCTCCC ATCTACTA AGTTGGGAGG GAGATCATGC AAAAAAAAA GAGGGGAAGC CTGAAAAAAC ACATGTCTCA TGATAGCAAG TTGATGTGGT TAGCGTGTCC AGGGGAACC AAATACGAGG ACTATTTTTG GGTGGGGAGG GCCAGAGAGT ACAGGGACCA    | TCTGGCTGTG GTTTCTCGGC GGTGCTTCCT GGATTTCAAG GGCCTCCTA TTCCCTTTT AAAATACAAC CTGAGGCAGG CACTGCACTC AGCCTTGGTT CAGTCAATCT TGTAGCATTC TGTCTAAGTT TGTCAGGCTG CTGAGTTAGA TGTGTTCTGA AACTAAAAAC TATTTAGTTT CCCTTAAGGG GTTAAGAAA GGACGGCAGA GAGCCTGGGA             | AGCAGCAGAA CTGGGGTCAG TGCTCCACCT GGCTTTTGTT AACCCTGCCC GGCTTATCTG AATTAGCCGG AGAAACGCTT CAGCCTGGTG GTAGGGAGTT CCCTTCTGTT ACCTCATTAT ATATTGGATG AATGAGGTTA CGTGCTCTGT ATGTCTGAT ATTTAAAACT CATGTTGTC TACATTCAAA AGAAACCAGA CCACGTTCTC GGCACTGTCC   |

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4501 GGACCTAAAC AGTGTCCCC AAATGAGGA AGGGAGGACA GAAAGAACAC TTCAGGATGG
4561 AAATGGGCTG ACACTTAACC GTGGAGTGT TCTGCAAACT TCCTTTGCCA TTCTCCTGTT
4621 TGAGTTTGAT AAACCTGAGA AGGACCTTGG ATAAAGACCG TCACGAAGAC TACACTAATG
4681 AGTTTCTTCT AGCTTTTC TACTCACTTT CCCTATCTACT CCTTCACATT GGGAGTTGGC
4741 ATGAGGATCC CAGCAGCCA TCAGGGGAGG ACTCTAGAGA TCCCTTTCCC CATTGCCTCT
4801 CCTCCCATA CCCCAGGCA TACCTCCCA GGGCACGGAA GCTGAGAAGC AGTCCAGAAC
4861 CACAGTGGGC TAGTGAGGGG TACCTGCTGA TGTACCCTTT GGACAGCAT CTGCCCCACC
4921 CTGCAGGAAG AAGCAGAAGG AGGGAGAGGG TGAGGAGAG AATAAATAAC CCTGACCAGG
4981 GAGGTCCAAG GGAGTAGGCG GAGACAGGA GGCGGAAG CAGCACT CTGCCCCACC
```

Note: The three high score predictions of promoters were bold and underlined. The lower case sequence indicates the beginning part of the transcript of 101P3A11 gene.--

Please replace Table XXX, beginning at page 214, line 35, with the following rewritten Table XXX:

-- Table XXX: Promoters and their positions predicted by Neural Network Promoter Prediction computer program. (various portions of SEQ ID NO: 2867, respectively, in order of appearance)

| Start | End  | Score | Promoter Sequence                                  |
|-------|------|-------|--|
| 25    | 75   | 0.91  | TTTTGCATTTTTAATAGAGGCAGGGTTTCACCATGTTGGCCTGGCTGG   |
| 665   | 715  | 0.95  | CAGGAAGTTGTATATAAGGAGAATCAGAGCAGAGAGAGACTAGGGTTCAG |
| 2477  | 2527 | 0.91  | TCAGTGTGCGTATATGTGAGAGAGAGGGTGCACACATGGAATACGTACTG |
| 3139  | 3189 | 0.82  | TGACATGACTCTAAGATGCCCAGTTTCTCGGCCTGGGGTCAGCCTGGGTG |
| 3420  | 3470 | 0.96  | GCCAAACATGTATAAAAGTCCTTGGTTCCCCATCTCTACTAAAAATACAA |
| 4092  | 4142 | 0.99  | AACTGATCAGTAAAAAATAAGGGGAGACCAACTAAAAACCATGTTGTTCT |
| 4953  | 5003 | 0.97  | AGGCAGAGAATAAATAACCCTGACCAGGGAGGTCCAAGGGAGTAGGCGGA |

Please replace Table XXXI, beginning at page 215, line 1, with the following rewritten Table XXXI:

-- Table XXXI: Alignment of five homologous 5' upstream genomic regulatory regions of the human 101P3A11 and PSA genes.

Query: 5' upstream regulatory region of the PSA gene Subject: Putative 5' upstream regulatory region of the 101P3A11 gene. Nucleic acid sequences predicted to be binding sites for the

Nucleic acid sequences predicted to be binding sites for the indicated transcription factors are **bolded**, <u>underlined</u>, or *italicized*.

| 1.<br>Query: 3864 | NF-1 SP-1 NF-1 ccaggctggagtgcagtcggagtctcggctcactgcaacctctgcctcccaggttcaa | 3923 |
|-------------------|---|------|
| (SEQ ID NO:       | 2868)   |      |
|                   | gtgattctcctgcctcagcctcctgagttgctgggattacaggcatgcagcaccatgccc              |      |

Query: 3984 agctaatttttgtatttttagtagagatgggg 4015

| 2. Query: 4670 cctgtaatcccagctactgaggaggctgaggcaggagaatcacttgaacccagaaggcag 4729 (SEQ ID NO: 2870) |
|--|
| (SEQ ID NO: 2871) $\begin{array}{cccccccccccccccccccccccccccccccccccc$                             |
| Query: 4730 aggttgcaatgagccgagattgcgccactgcactccagcctgggtgacagagtgagactc 478                       |
| Query: 4790 tgtctcaaaaaaaaaaa 4807   |
|  |
| 3.  GR NF-1 SP1  |
| Query: 142 tgagactgagtctcgctctgtgcccaggctggagtgcagtggtgcaaccttggctcactg 201 (SEQ ID NO: 2872)      |
|  |
| Query: 202 caageteegeeteetgggtteaegeeatteteetgeeteageeteetgagtagetgggac 261                        |
| Sbjct: 3561 caacctccaccttgcgggctcaagcgtttctcctgcctcagcctcccaactagctgggac 350                       |
| Query: 262 tacaggcacccgccaccacgcctggctaannnnnnngtatttttagtagagatgggg 318                           |
| Sbjct: 3501 tacaggcacgcgccatcacacccggctaattgttgtatttttagtagagatgggg 3447                           |
| 4. Query: 300 atttttagtagagatggggtttcactgtgttagccaggatggtctcagtctcctgacctc 359 (SEQ ID NO: 2874)   |
| Sbjct: 31 atttttaatagaggcagggtttcaccatgttggcctggctgg   |
| $\begin{array}{c} \underline{\text{SP1}} \\ \textbf{LF-A1} \end{array}$                            |
| Query: 360 gtgatctgcccaccttggcctcccaaagtgctgggattacaggcgtgagccactgcgcct 419                        |
| NF-1   |
| Query: 420 ggc 422   |
| Sbjct: 151 ggc 153   |

5.

#### REMARKS

The Specification has been amended to correct erroneous sequence identification numbers and include sequence identification numbers which were omitted at the time of filing.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "<u>Version with markings to show changes</u> <u>made.</u>".

The undersigned hereby states that the compact disc copy of the Sequence Listing and the computer readable form copy of the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.825(a) and (b), respectively, are the same and contain no new matter. Accordingly, entry of the Sequence Listing into the above-captioned case is respectfully requested.

In the unlikely event that the patent office determines that extensions and/or other relief is required, applicant petition for any required relief including extensions of time and authorize the assistant commissioner to charge the cost of such petitions and/or fees due to our deposit account no. <u>03-1952</u> under order no. <u>511582002420</u>. The assistant commissioner is <u>not</u> authorized to charge the cost of the issue fee to the deposit account.

Respectfully submitted,

Dated: May 20, 2002

Ву:

Kate H. Murashige

Registration No. 29,959

Morrison & Foerster LLP 3811 Valley Centre Drive

Suite 500

San Diego, California 92130-2332

Telephone: (858) 720-5112 Facsimile: (858) 720-5125

#### VERSION WITH MARKINGS TO SHOW CHANGES MADE

#### In the Specification:

The paragraph beginning at page 7, line 21, has been amended as follows:

Figure 1. 101P3A11 SSH sequence (SEQ ID NO:2960). The 101P3A11 SSH sequence.

The paragraph beginning at page 7, line 22, has been amended as follows:

Figures 2A-2D. The cDNA (SEQ ID. NO. :2961) and amino acid sequence (SEQ ID. NO. :2962) of 101P3A11. The start methionine is underlined. The open reading frame extends from nucleic acid 133 to 1086 including the stop codon (the codon for the initial M is omitted as the shorter peptide has a more favorable Kozak sequence).

The paragraph beginning at page 7, line 26, has been amended as follows:

Figure 3. Amino acid sequence of 101P3A11 (SEQ ID. NO. :piece of 2962). The 101P3A11 protein has 317 amino acids.

The paragraph beginning at page 7, line 28, has been amended as followsh:

Figure 4. Alignment of 101P3A11 (Sbjct) (SEQ ID NO: 2964) with mouse olfactory receptor S25 (Query.) (SEQ ID NO: 2963) The transmembrane regions of 101P3A11 and mouse olfactory receptor S25 (ORS25) predicted using the TMHMM algorithm are highlighted in gray. The amino acids of ORS25 predicted (Floriano, W.B., et al, 2000, Proc. Natl. Acad. Sci., USA, 97:10712-10716) to be involved in binding of the ligand hexanol and/or involved in the formation of the ligand binding pocket are italicized and bolded in the Figure, and are: Leu 131, Val 134, Val 135, Gly 138, Thr139, Ser 193, Ser 197, Phe 225, Ala 230, Ile 231, Gly 234, Thr 284, Phe 287, Gln 300, Lys 302.

The paragraph beginning at page 11, line 31, has been amended as follows:

**Figure 23.** Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2965) with the rat (SEQ ID NO: 2966) GPCR RA1C (gi|3420759). Identities = 179/299 (59%), Positives = 231/299 (76%), Gaps = 1/299 (0%).

The paragraph beginning at page 12, line 1, has been amended as follows:

**Figure 24.** Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2967) with the human prostate specific GPCR (SEQ ID NO: 2968) (gi|13540539). Identities = 179/299 (59%), Positives = 233/299 (77%), Gaps = 1/299 (0%).

The paragraph beginning at page 12, line 3, has been amended as follows:

Figure 25. Alignment of 101P3A11-PHOR-1 (Phor) (SEQ ID NO: 2969) with human olfactory receptor 5II12, HOR5 (SEQ ID NO: 2970) (gi|14423836). Identities = 163/304 (53%), Positives = 214/304 (69%), Gaps = 1/304 (0%).

The paragraph beginning at page 36, line 20, has been amended as follows:

Also, different MHC class I molecules prefer a different length of ligands. For example, SYFPEITHI offers predictions for H2-Kb octamers, HLA-A\*0201 nonamers and decamers, or HLA-B8 octamers and nonamers. The maximal scores vary between different MHC alleles. Therefore, one can include known ligands/epitopes in order to have an approximation of the scoring. For example, the maximal score for HLA-A\*0201 peptides is 36. The well-known epitope GILGFVFTL (SEQ ID NO: 1401) derived from the influenza A matrix protein scores 30. All predicted MHC class II ligands are 15mers, consisting of three N-terminal flanking residues, the nonamer core sequence located within the binding groove, and three C-terminal flanking residues. Thus, anchor residue P1 appears in position 4 of the peptides predicted with "SYFPEITHI".

The paragraph beginning at page 37, line 25, has been amended as follows:

In an embodiment described in the examples that follow, 101P3A11 can be conveniently expressed in cells (such as 293T cells) transfected with a commercially available expression vector such as a CMV-driven expression vector encoding 101P3A11 with a C-terminal 6XHis (SEQ ID NO: 1402) and MYC tag (pcDNA3.1/mycHIS, Invitrogen or Tag5, GenHunter Corporation, Nashville TN). The Tag5 vector provides an IgGK secretion signal that can be used to facilitate the production of a secreted 101P3A11 protein in transfected cells. The secreted HIS-tagged 101P3A11 in the culture media can be purified, e.g., using a nickel column using standard techniques.

The paragraph beginning at page 70, line 3, has been amended as follows:

In certain embodiments, the T helper peptide is one that is recognized by T helper cells present in a majority of a genetically diverse population. This can be accomplished by selecting peptides that bind to many, most, or all of the HLA class II molecules. Examples of such amino acid bind many HLA Class II molecules include sequences from antigens such as tetanus toxoid at positions 830-843 (QYIKANSKFIGITE; [SEQ ID NO: 710] (SEQ ID NO: 1403), *Plasmodium falciparum* circumsporozoite (CS) protein at positions 378-398 (DIEKKIAKMEKASSVFNVVNS; [SEQ ID NO: 711] (SEQ ID NO: 1404), and *Streptococcus* 18kD protein at positions 116-131 (GAVDSILGGVATYGAA; [SEQ ID NO: 712] (SEQ ID NO: 712) (SEQ ID NO: 713). Other examples include peptides bearing a DR 1-4-7 supermotif, or either of the DR3 motifs.

The paragraph beginning at page 70, line 11, has been amended as follows:

Alternatively, it is possible to prepare synthetic peptides capable of stimulating T helper lymphocytes, in a loosely HLA-restricted fashion, using amino acid sequences not found in nature (*see*, *e.g.*, PCT publication WO 95/07707). These synthetic compounds called Pan-DR-binding epitopes (*e.g.*, PADRE™, Epimmune, Inc., San Diego, CA) are designed to most preferably bind most HLA-DR (human HLA class II) molecules. For instance, a pan-DR-binding epitope peptide having the formula: aKXVAAWTLKAAa [SEQ ID NO: 713] (SEQ ID NO: 1406), where "X" is either cyclohexylalanine, phenylalanine, or tyrosine, and a is either Dalanine or L-alanine, has been found to bind to most HLA-DR alleles, and to stimulate the response of T helper lymphocytes from most individuals, regardless of their HLA type. An alternative of a pan-DR binding epitope comprises all "L" natural amino acids and can be provided in the form of nucleic acids that encode the epitope.

The paragraph beginning at page 80, line 16, has been amended as follows:

Single chain antibodies comprise the variable domains of the heavy and light chain joined by a flexible linker polypeptide, and are expressed as a single polypeptide. Optionally, single chain antibodies are expressed as a single chain variable region fragment joined to the light chain constant region. Well-known intracellular trafficking signals are engineered into recombinant

polynucleotide vectors encoding such single chain antibodies in order to precisely target the intrabody to the desired intracellular compartment. For example, intrabodies targeted to the endoplasmic reticulum (ER) are engineered to incorporate a leader peptide and, optionally, a C-terminal ER retention signal, such as the KDEL (SEQ ID NO: 1407) amino acid motif. Intrabodies intended to exert activity in the nucleus are engineered to include a nuclear localization signal. Lipid moieties are joined to intrabodies in order to tether the intrabody to the cytosolic side of the plasma membrane. Intrabodies can also be targeted to exert function in the cytosol. For example, cytosolic intrabodies are used to sequester factors within the cytosol, thereby preventing them from being transported to their natural cellular destination.

The paragraph beginning at page 86, line 29, has been amended as follows:

pGEX Constructs: To generate recombinant 101P3A11 proteins in bacteria that are fused to the Glutathione S-transferase (GST) protein, all or parts of the 101P3A11 cDNA protein coding sequence are fused to the GST gene by cloning into pGEX-6P-1 or any other GST- fusion vector of the pGEX family (Amersham Pharmacia Biotech, Piscataway, NJ). These constructs allow controlled expression of recombinant 101P3A11 protein sequences with GST fused at the amino-terminus and a six histidine epitope (6X His) (SEQ ID NO: 1402) at the carboxylterminus. The GST and 6X His tags permit purification of the recombinant fusion protein from induced bacteria with the appropriate affinity matrix and allow recognition of the fusion protein with anti-GST and anti-His antibodies. The 6X His tag (SEQ ID NO: 1402) is generated by adding 6 histidine (SEQ ID NO: 1402) codons to the cloning primer at the 3' end, e.g., of the open reading frame (ORF). A proteolytic cleavage site, such as the PreScission TM recognition site in pGEX-6P-1, can be employed that permits cleavage of the GST tag from 101P3A11-related protein. The ampicillin resistance gene and pBR322 origin permit selection and maintenance of the pGEX plasmids in *E. coli*. In one embodiment, amino acids 86-317 are cloned into the pGEX-2T expression vector, the protein is expressed and purified.

The paragraph beginning at page 87, line 8, has been amended as follows:

pMAL Constructs: To generate, in bacteria, recombinant 101P3A11 proteins that are fused to maltose-binding protein (MBP), all or parts of the 101P3A11 cDNA protein coding sequence are fused to the MBP gene by cloning into the pMAL-c2X and pMAL-p2X vectors

(New England Biolabs, Beverly, MA). These constructs allow controlled expression of recombinant 101P3A11 protein sequences with MBP fused at the amino-terminus and a 6X His (SEQ ID NO: 1402) epitope tag at the carboxyl-terminus. The MBP and 6X His tags (SEQ ID NO: 1402) permit purification of the recombinant protein from induced bacteria with the appropriate affinity matrix and allow recognition of the fusion protein with anti-MBP and anti-His antibodies. The 6X His (SEQ ID NO: 1402) epitope tag is generated by adding 6 histidine (SEQ ID NO: 1402) codons to the 3' cloning primer. A Factor Xa recognition site permits cleavage of the pMAL tag from 101P3A11. The pMAL-c2X and pMAL-p2X vectors are optimized to express the recombinant protein in the cytoplasm or periplasm respectively. Periplasm expression enhances folding of proteins with disulfide bonds. In one embodiment, amino acids 86-310 is cloned into the pMAL-c2X expression vector, the protein is expressed and purified.

The paragraph beginning at page 87, line 20, has been amended as follows:

pET Constructs: To express 101P3A11 in bacterial cells, all or parts of the 101P3A11 cDNA protein coding sequence are cloned into the pET family of vectors (Novagen, Madison, WI). These vectors allow tightly controlled expression of recombinant 101P3A11 protein in bacteria with and without fusion to proteins that enhance solubility, such as NusA and thioredoxin (Trx), and epitope tags, such as 6X His (SEQ ID NO: 1402) and S-Tag ™ that aid purification and detection of the recombinant protein. For example, constructs are made utilizing pET NusA fusion system 43.1 such that regions of the 101P3A11 protein are expressed as amino-terminal fusions to NusA.

The paragraph beginning at page 88, line 19, has been amended as follows:

pcDNA4/HisMax Constructs: To express 101P3A11 in mammalian cells, the 101P3A11 ORF was cloned into pcDNA4/HisMax Version A (Invitrogen, Carlsbad, CA). Protein expression is driven from the cytomegalovirus (CMV) promoter and the SP16 translational enhancer. The recombinant protein has Xpress<sup>TM</sup> and six histidine (6X His) (SEQ ID NO: 1402) epitopes fused to the amino-terminus. The pcDNA4/HisMax vector also contains the bovine growth hormone (BGH) polyadenylation signal and transcription termination sequence to enhance mRNA stability along with the SV40 origin for episomal replication and

simple vector rescue in cell lines expressing the large T antigen. The Zeocin resistance gene allows for selection of mammalian cells expressing the protein and the ampicillin resistance gene and ColE1 origin permits selection and maintenance of the plasmid in *E. coli*.

The paragraph beginning at page 88, line 28, has been amended as follows:

pcDNA3.1/MycHis Constructs: To express 101P3A11 in mammalian cells, the 101P3A11 ORF, with a consensus Kozak translation initiation site, was cloned into pcDNA3.1/MycHis Version A (Invitrogen, Carlsbad, CA). Protein expression is driven from the cytomegalovirus (CMV) promoter. The recombinant proteins have the myc epitope and 6X His (SEQ ID NO: 1402) epitope fused to the carboxyl-terminus. The pcDNA3.1/MycHis vector also contains the bovine growth hormone (BGH) polyadenylation signal and transcription termination sequence to enhance mRNA stability, along with the SV40 origin for episomal replication and simple vector rescue in cell lines expressing the large T antigen. The Neomycin resistance gene can be used, as it allows for selection of mammalian cells expressing the protein and the ampicillin resistance gene and ColE1 origin permits selection and maintenance of the plasmid in *E. coli*.

The paragraph beginning at page 89, line 16, has been amended as follows:

PAPtag: The 101P3A11 ORF, or portions thereof, of 101P3A11 are cloned into pAPtag-5 (GenHunter Corp. Nashville, TN). This construct generates an alkaline phosphatase fusion at the carboxyl-terminus of the 101P3A11 proteins while fusing the IgGκ signal sequence to the amino-terminus. Constructs are also generated in which alkaline phosphatase with an amino-terminal IgGκ signal sequence is fused to the amino-terminus of 101P3A11 proteins. The resulting recombinant 101P3A11 proteins are optimized for secretion into the media of transfected mammalian cells and can be used to identify proteins such as ligands or receptors that interact with the 101P3A11 proteins. Protein expression is driven from the CMV promoter and the recombinant proteins also contain myc and 6X His (SEQ ID NO: 1402) epitopes fused at the carboxyl-terminus that facilitates detection and purification. The Zeocin resistance gene present in the vector allows for selection of mammalian cells expressing the recombinant protein and the ampicillin resistance gene permits selection of the plasmid in *E. coli*.

The paragraph beginning at page 89, line 27, has been amended as follows:

ptag5: The 101P3A11 ORF, or portions thereof, of 101P3A11 are cloned into pTag-5. This vector is similar to pAPtag but without the alkaline phosphatase fusion. This construct generated 101P3A11 protein with an amino-terminal IgGκ signal sequence and myc and 6X His (SEQ ID NO: 1402) epitope tags at the carboxyl-terminus that facilitate detection and affinity purification. The resulting recombinant 101P3A11 protein was optimized for secretion into the media of transfected mammalian cells, and was used as immunogen or ligand to identify proteins such as ligands or receptors that interact with the 101P3A11 proteins. Protein expression is driven from the CMV promoter. The Zeocin resistance gene present in the vector allows for selection of mammalian cells expressing the protein, and the ampicillin resistance gene permits selection of the plasmid in *E. coli*.

The paragraph beginning at page 90, line 30, has been amended as follows:

Additional pSRα constructs are made that fuse an epitope tag such as the FLAG<sup>TM</sup> tag to the carboxyl-terminus of 101P3A11 sequences to allow detection using anti-Flag antibodies. For example, the FLAG<sup>TM</sup> sequence 5' gat tac aag gat gac gat aag 3' (SEQ ID NO: 1408) is added to cloning primer at the 3' end of the ORF. Additional pSRα constructs are made to produce both amino-terminal and carboxyl-terminal GFP and myc/6X His (SEQ ID NO: 1402) fusion proteins of the full-length 101P3A11 proteins.

The paragraph beginning at page 141, line 31, has been amended as follows:

The generation of anti-101P3A11 polyclonal Ab (pAb) using an amino-terminal peptide encoding amino acids 1-14 (MVDPNGNESSATYF; [SEQ ID NO:YY] (SEQ ID NO: 1409) as antigen was reported in our Priority Application. The effect of this antibody on 101P3A11 mediated ERK phosphorylation (Figure 38) and cAMP accumulation (Figure 39) was determined. 293T cells were transfected with control or 101P3A11 cDNA. Cells were allowed to rest overnight, and treated with anti-101P3A11 or control Ab in the presence of 0.5% or 10% FBS. Cells were lysed and analyzed by Western blotting with anti-Phospho-ERK and anti-ERK mAb. Figure 38 shows that expression of 101P3A11 induces ERK phosphorylation in cells treated with 0.5 or 10% FBS. Anti-101P3A11 pAb reduced the phosphorylation of ERK in

293T-101P3A11 cells treated with 0.5% FBS. The ERK overlay demonstrated equal loading, supporting the specificity of this data.

Table XIX, beginning at page 186, has been amended as follows:

Table XIX: Motifs and Post-translational Modifications of 101P3A11

N-glycosylation site

Number of matches: 3

- 7-10 NESS (SEQ ID NO: 1410)
- 44-47 NLTI (SEQ ID NO: 1411)
- 90-93 NSTT (SEQ ID NO: 1412)

cAMP- and cGMP-dependent protein kinase phosphorylation site 268-271 RRDS (SEQ ID NO: 1413)

Protein kinase C phosphorylation site 266-268 SKR

Casein kinase II phosphorylation site

Number of matches: 3

- 56-59 SLHE (SEQ ID NO: 1414)
- 2 69-72 SGID (SEQ ID NO: 1415)
- 110-113 SGME (SEQ ID NO: 1416)

N-myristoylation site

Number of matches: 4

- 6-11 GNESSA <u>(SEQ ID NO: 1417)</u> 21-26 GLEEAQ <u>(SEQ ID NO: 1418)</u> 111-116 GMESTV (SEQ ID NO: 1419)
- 240-245 GTCVSH (SEQ ID NO: 1420)

G-protein coupled receptors family 1 signature

112-128 MESTVLLAMAFDRYVAI (SEQ ID NO: 1421)

Table XXI, beginning at page 190, line 1, has been amended as follows:

Table XXI: Nucleotide sequence of the splice variant (SEQ ID NO: 1422)

- 1 CACATTCCTT CCATACGGTT GAGCCTCTAC CTGCCTGGTG CTGGTCACAG TTCAGCTTCT
- 61 TCATGATGGT GGATCCCAAT GGCAATGAAT CCAGTGCTAC ATACTTCATC CTAATAGGCC
- 121 TCCCTGGTTT AGAAGAGGCT CAGTTCTGGT TGGCCTCCCA TTGTGCTCCC TCTANCTATG
- 181 CTGTGCTAGT AATTGACAAT CATCTACATG TGCGGACGAG CACGNCGCNG AGCCCNGTAT
- 241 NATTCTGCNG CTTCAGCATG ACACCCTNCA GTCTCAGCCA AAGNGCATCT CNGTCAATCA
- 301 NACACNTGAG CTGTCGTACG AGTTGCATCA TCCTANGGCA GGATCAATGT GCGGNAGGCN

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361 TGACGCAGTG CACGTACCAT GGCAGCAAGA CAGGGCCGGT ACAAATGGGG GCGAGNCGGG
421 GTGAAGATGN ACCCTCGGGT CANAGAGTGC CTCTGCGCCA AAACCTCCAT CATGNNAACA
481 GNGTATAACG GCGNAGAATC GGNNANGCGC AAGGCTAAGG AAANNCCCAA NNCNGGTACT
541 TTAACCCNGC AAANGGCANC NAAACGGGNG GGTNANTGAA CAAGGAAGGN NTGNAACTGG
601 GCCAAAACGG GNTGGGCAAN NNAAGGACTC ATGGGNCCAA GGGACGGNAA AAGGGGNAAN
661 CGGGGCGAAA TGNNAAAAAC CGGGNCCCGG GGAANAANGA AGGGGAANAN GNGTGAAGGA
721 CNGGGTTCAA GGGAAAAGNA AAACCANGGG NNAGAAACCN TTCNAANGGC CCGGGNANGA
781 AAGGAANTNN GNNNGGNGAA AAAATCNAAA AAAAGCNGNG GCNNAAAAAN GGGGGGAANN
841 NAAANACCNN GGNCGNNAAA AAACNNAANG NGGGGGGANT ANACACGGAA ANNNANGGGC
901 GNNNAAGGGA AATAANNCGG GAACNAAAGN GCAAACCGNA CGGNAGGAAC GAAACCCACC
961 GGAGNCGCNN AACGCCNNNC NNANCCCGAG CNGAGGTNG
```

Table XXII, beginning at page 190, line 38, has been amended as follows:

Table XXII: Nucleotide sequence alignment of 101P3A11 with the splice variant.

Score = 337 bits (175), Expect = 4e-89Identities = 215/223 (96%), Gaps = 6/223 (2%) Strand = Plus / Plus

```
101P3A11: 68 cacatteetteeataeggttgageetetaeetgeetgqtegqteacagtteagettet 127
(SEQ ID NO: 1423)
          Variant : 1
          cacatteetteeataeggttgageetetaeetgeetggtgetggteacagtteagettet 60
(SEQ ID NO: 1424)
101P3A11: 128 tcatgatggtggatcccaatggcaatgaatccagtgctacatacttcatcctaataggcc 187
          Variant : 61 tcatgatggtggatcccaatggcaatgaatccagtgctacatacttcatcctaataggcc 120
101P3All: 188 tccctggtttagaagaggctcagttctggttggccttcccattgtgctccctctacctta 247
          Variant : 121 tccctggtttagaagaggctcagttctggttggcc-tcccattgtgctccctctanct-- 177
101P3A11: 248 ttgctgtgctaggtaacttgacaatcatctacattgtgcggac 290
          Variant : 178 atgctgtgcta-gtaa-ttgacaatcatctaca-tgtgcggac 217
```

Table XXIII, beginning at page 191, line 8, has been amended as follows:

Table XXIII: Longest single amino acid sequence alignment of 101P3A11 and the splice variant. Score = 134 bits (287), Expect (2) = 3e-29Identities = 51/51 (100%) Frame = +1 / +3

101P3A11: 70 HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA 222 (SEQ ID NO: 1425)

HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA

Variant : 3 HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLA 155 (SEQ ID NO: 1426)

Table XXIV, beginning at page 191, line 16, has been amended as follows:

Table XXIV: Peptide sequences from the translation of the nucleotide sequence of the splice variant .

| Open reading           | Amino acid sequences   |
|------------------------|--|
| frame                  |  |
| Frame 1 (SEQ ID        | HIPSIRLSLYLPGAGHSSASS*WWIPMAMNPVLHTSS**ASLV*KRLSSGWPPIVLPLXM |
| NO: 1427)              | LC**LTIIYMCGRARRXAXYXSAASA*HPXVSAKXHLXQSXT*AVVRVASSXGRINVRXA |
| 1                      | *RSARTMAARQGRYKWGRXGVKMXPRVXECLCAKTSIMXTXYNGXESXXRKAKEXPXXGT |
|                        | LTXQXAXKRXGX*TRKXXNWAKTGWAXXGLMGPRDGKRGXRGEMXKTGXRGXXKGXXXEG |
| *                      | XGSREKXNXGXETXXXARXXKEXXXXKKSKKSXGXKXGGXXXPXXXKNXXXGXXTRKXXG |
|                        | XXGK*XGNXXANRTXGTKPTGXAXRXXXPEXRX                            |
| Frame 2(SEQ ID         | TFLPYG*ASTCLVLVTVQLLHDGGSQWQ*IQCYILHPNRPPWFRRGSVLVGLPLCSLXLC |
| NO: 1428)              | CASN*QSSTCADEHXAEPXXILXLQHDTLQSQPKXISVNXTXELSYELHHPXAGSMCGRX |
|                        | DAVHVPWQQDRAGTNGGEXG*RXTLGSXSASAPKPPSXXQXITAXNRXXARLRKXPXXVL |
|                        | *PXKXXXNGXVXEQGRXXTGPKRXGQXKDSWXQGTXKGXXGAKXXKPGPGEXXRGXXVKD |
|                        | XVQGKXKTXGXKPFXXPGXERXXXXXKNXKKAXAXKXGEXKXXGRXKTXXGGXXHGXXXA |
|                        | XKGNXXGTKXQTXRXERNPPEXXNAXXXPSXG                             |
| Frame 3 <u>(SEQ ID</u> | HSFHTVEPLPAWCWSQFSFFMMVDPNGNESSATYFILIGLPGLEEAQFWLASHCAPSXYA |
| NO: 1429)              | VLVIDNHLHVRTSTXXSPVXFCXFSMTPXSLSQXASXSIXHXSCRTSCIILXQDQCAXGX |
|                        | TQCTYHGSKTGPVQMGAXRGEDXPSGXRVPLRQNLHHXNXV*RRRIGXAQG*GXXQXXYF |
| '                      | NPAXGXXTGGXXNKEGXXLGQNGXGXXRTHGXKGRXKGXXGRNXKNRXPGXXEGEXX*RT |
|                        | GFKGKXKPXXRNXSXGPGXKGXXXGEKIXKKXXXKXGGXXXTXXXKKXXXGGXXTEXXGR |
|                        | XREIXREXKXKPXGRNETHRXRXTPXXXRAEV                             |

Note: Frame 3 gives the longest subsequence that is identical with 101P3A11 amino acid sequence. In this Table each (\*)indicates the product of a single stop codon, and 'X' indicates a single unknown amino acid.

Table XXVI, beginning at page 193, line 1, has been amended as follows:

#### Table XXVI:

HLA Class I Nonamers (SEQ ID NOS 1430-1462, respectively in order of appearance)

|    | HLA-A1 | n | one                      | ome | ers | 3            |   |                          |   |   |       |
|----|--------|---|--------------------------|-----|-----|--------------|---|--------------------------|---|---|-------|
|    | Pos    | 1 | 2                        | 3   | 4   | 5            | 6 | 7                        | 8 | 9 | score |
| 1  | 245    | H | $\underline{v}$          | C   | A   | v            | F | I                        | F | Y | 24    |
| 2  | 29     | L | A                        | F   | Р   | L            | C | s                        | L | Y | 21    |
| 3  | 41     | V | Ŀ                        | G   | N   | $\mathbf{L}$ | T | I                        | Ι | Y | 21    |
| 4  | 285    | P | P                        | v   | L   | N            | P | Ī                        | v | Y | 20    |
| 5  | 111    | G | M                        | E   | s   | Т            | V | $\underline{\mathbf{L}}$ | L | A | 19    |
| 6  | 117    | L | $\overline{\Gamma}$      | A   | M   | Α            | F | $\underline{\mathtt{D}}$ | R | Y | 19    |
| 7  | 172    | R | $\underline{\mathbf{s}}$ | N   | Ι   | $\mathbf{L}$ | S | $\underline{\mathbf{H}}$ | S | Y | 19    |
| 8  | 192    | D | $\underline{\mathtt{D}}$ | I   | R   | V            | N | $\underline{v}$          | V | Y | 19    |
| 9  | 212    | D | <u>s</u>                 | L   | L   | I            | s | F                        | s | Y | 19    |
| 10 | 57     | L | H                        | E   | P   | M            | Y | Ī                        | F | L | 18    |
| 11 | 22     | L | E                        | E   | Α   | Q            | F | W                        | L | A | 17    |
| 12 | ٠ 9    | s | $\underline{\mathbf{s}}$ | A   | T   | Y            | F | Ī                        | L | I | 16    |
| 13 | 52     | R | $\underline{\mathbf{T}}$ | E   | Н   | s            | L | H                        | E | P | 16    |
| 14 | 54     | Е | H                        | S   | L   | Н            | E | P                        | M | Y | 16    |
|    |        |   |                          |     |     |              |   |                          |   |   | 60    |

|    | HLA-A1 | no           | one                                  | ome | ers          | 3 |   |                                      |   |   |       |
|----|--------|--------------|--------------------------------------|-----|--------------|---|---|--------------------------------------|---|---|-------|
|    | Pos    | 1            | 2                                    | 3   | 4            | 5 | 6 | 7                                    | 8 | 9 | score |
| 15 | 78     | S            | $\underline{s}$                      | M   | P            | K | М | Ŀ                                    | Α | I | 16    |
| 16 | 95     | Q            | $\underline{\mathbf{F}}$             | D   | A            | С | L | $\underline{\mathtt{L}}$             | Q | I | 16    |
| 17 | 159    | Α            | $\underline{\mathbf{P}}$             | L   | P            | V | F | Ī                                    | K | Q | 16    |
| 18 | 183    | Н            | $\underline{\underline{Q}}$          | D   | V            | М | K | $\bar{\Gamma}$                       | Α | C | 16    |
| 19 | 1      | M            | $\underline{\mathtt{v}}$             | D   | P            | N | G | $\underline{\mathbf{N}}$             | Ε | s | 15    |
| 20 | 5      | N            | $\underline{G}$                      | N   | E            | s | s | <u>A</u>                             | Т | Y | 15    |
| 21 | . 210  | G            | $\underline{\mathbf{L}}$             | D   | s            | L | L | Ī                                    | S | F | 15    |
| 22 | 273    | L            | $\underline{\underline{P}}$          | v   | Ι            | L | A | $\underline{\underline{N}}$          | I | Y | 15    |
| 23 | 271    | S            | $\underline{\underline{P}}$          | L   | P            | V | Ι | $\underline{\underline{\mathbf{L}}}$ | A | N | 14    |
| 24 | 91     | S            | $\underline{\underline{\mathbf{T}}}$ | T   | I            | Q | F | $\underline{\mathtt{D}}$             | A | C | 13    |
| 25 | 121    | A            | $\underline{\mathbf{F}}$             | D   | R            | Y | V | A                                    | I | C | 13    |
| 26 | 138    | L            | $\underline{\mathbf{T}}$             | L   | P            | R | V | T                                    | K | I | 13    |
| 27 | 218    | F            | <u>s</u>                             | Y   | $\mathbf{r}$ | L | Ι | $\bar{\Gamma}$                       | K | T | 13    |
| 28 | 282    | L            | $\underline{\textbf{L}}$             | v   | P            | P | V | $\overline{\mathbf{L}}$              | N | P | 13    |
| 29 | 190    | A            | <u>C</u>                             | D   | D            | Ι | R | $\underline{V}$                      | N | v | 12    |
| 30 | 191    | С            | ₫                                    | D   | I            | R | ٧ | $\underline{N}$                      | V | v | 12    |
| 31 | . 231  | $\mathbf{T}$ | $\underline{\underline{R}}$          | E   | Α            | Q | A | K                                    | Α | F | 12    |
| 32 | 268    | R            | $\underline{\mathbf{R}}$             | D   | S            | P | L | $\underline{\mathtt{P}}$             | V | I | 12    |
| 33 | 270    | D            | $\underline{\mathbf{s}}$             | P   | L            | P | V | $\underline{\mathtt{I}}$             | L | A | 12    |

### NOS 1463-1569, respectively in order of appearance)

|    | Pos | 1 | 2 | 3            | 4            | 5            | 6                        | 7            | 8 | 9            | score |
|----|-----|---|---|--------------|--------------|--------------|--------------------------|--------------|---|--------------|-------|
| 1  | 287 | v | L | N            | P            | I            | v                        | Ý            | G | v            | 30    |
| 2  | 14  | F | I | L            | I            | G            | L                        | P            | G | L            | 29    |
| 3  | 28  | W | L | A            | F            | P            | L                        | C            | s | L            | 28    |
| 4  | 37  | Y | L | Ι            | Α            | v            | L                        | G            | N | L            | 28    |
| 5  | 222 | L | I | L            | K            | Т            | v                        | L            | G | L            | 28    |
| 6  | 66  | C | M | L            | S            | G            | I                        | D            | Ι | L            | 26    |
| 7  | 108 | S | L | s            | G            | M            | E                        | s            | Т | v            | 26    |
| 8  | 181 | С | L | Н            | Q            | D            | v                        | М            | K | L            | 26    |
| 9  | 201 | G | L | 1            | V            | Ι            | I                        | s            | Α | I            | 26    |
| 10 | 214 | L | L | Ι            | s            | F            | <u>s</u>                 | Y            | L | L            | 26    |
| 11 | 275 | v | I | L            | Α            | N            | Ī                        | Y            | L | L            | 26    |
| 12 | 157 | L | M | A            | P            | L            | <u>P</u>                 | V            | F | I            | 25    |
| 13 | 220 | Y | L | L            | Ι            | L            | <u>K</u>                 | T            | V | L            | 25    |
| 14 | 276 | I | L | Α            | N            | I            | Y                        | L            | L | v            | 25    |
| 15 | 279 | N | I | Y            | L            | L            | $\underline{v}$          | P            | P | v            | 25    |
| 16 | 138 | L | T | $\mathbf{L}$ | P            | R            | $\underline{\mathtt{v}}$ | $\mathbf{T}$ | K | I            | 24    |
| 17 | 213 | S | L | L            | Ι            | S            | $\underline{\mathbf{F}}$ | s            | Y | L            | . 24  |
| 18 | 49  | Y | I | V            | R            | T            | $\underline{\mathbf{E}}$ | Н            | S | L            | 23    |
| 19 | 143 | v | T | K            | Ι            | G            | $\underline{v}$          | Α            | Α | $\mathbf{v}$ | 23    |
| 20 | 188 | K | L | Α            | С            | D            | $\underline{\mathtt{D}}$ | I            | R | v            | 23    |
| 21 | 198 | V | v | Y            | G            | $\mathbf{L}$ | I                        | v            | I | I            | 23    |
| 22 | 21  | G | L | E            | E            | Α            | Q                        | F            | W | L            | 22    |
| 23 | 40  | Α | v | L            | G            | N            | $\underline{\mathbf{L}}$ | Т            | 1 | I            | 22    |
| 24 | 206 | I | S | A            | I            | G            | L                        | D            | s | L            | 22    |
| 25 | 11  | Α | T | Y            | F            | Ι            | Ŀ                        | Ι            | G | L            | 21    |
| 26 | 60  | P | M | Y            | 1            | F            | $\underline{\mathbf{L}}$ | C            | M | L            | 21    |
| 27 | 135 | Α | T | V            | $\mathbf{L}$ | Т            | F                        | P            | R | v            | 21    |
|    |     |   |   |              |              |              |                          |              |   |              | 61    |

HLA-A\*0201 nonomers (SEQ ID NOS 1463-1569, respectively in order of appearance)

|          | Pos        | 1  | 2      | 3      | 4      | 5      | 6                      | 7      | 8      | 9      | score    |
|----------|------------|----|--------|--------|--------|--------|------------------------|--------|--------|--------|----------|
| 28       | 160        |    | L      | P      | v      | F      | I                      | ĸ      | Q      | Ĺ      | 21       |
| 29       | 174        |    | I      | L      | s      | Н      | s                      | Y      | C      | L      | 21       |
| 30       | 207        |    | A      | I      | G      | L      | D D                    | s      | L      | L      | 21       |
| 31       | 272        |    | L      | P      | v      | I      | L                      | A      | N      | I      | 21       |
| 32       | 283        |    | v      | P      | P      | v      | L                      | N      | P      | I      | 21       |
| 33       | 67         |    | L      | s      | G      | I      | D                      | I      | L      | I      | 20       |
| 34       | 101        |    | Q      | I      | F      | A      | ī                      | Н      | s      | L      | 20       |
| 35       | 282        |    | L      | v      | P      | P      | v                      | L      | N      | P      | 20       |
| 36       | 299        |    | I      | R      | Q      | R      | Ĭ                      | L      | R      | L      | 20       |
| 37       | 304        |    | L      | R      | L      | F      | ±<br>H                 | v      | A      | T      | 20       |
| 38       | 39         |    | A      | V      | L      | G      | N                      | L      | Т      | I      | 19       |
| 39       | 45         |    | T      | I      | Ι      | Y      | I                      | v      | R      | T      | 19       |
| 40       | 92         |    | Ť      | I      | Q      | F      | ±<br>D                 | A      | C      | L      | 19       |
| 41       | 110        |    | G      | м      | E      | s      | T                      | V      | ь      | L      | 19       |
| 42       | 127        |    | I      | C      | Н      | P      | Ĺ                      | R      | Н      | A      | 19       |
| 43       | 132        |    | R      | Н      | Ά      | Т      | v                      | L      | Т      | L      | 19       |
| 44       | 149        |    | A      | V      | V      | R      | Ğ                      | А      | A      | L      | 19       |
| 45       | 155        |    | A      | L      | M      | A      | _                      | L      | P      | A P    | 19       |
| 46       | 156        |    | L      | М      | A      |        | P                      | Р      | V      |        |          |
| 47       | 203        |    | v      | I      |        | P      | ۲<br>ت                 |        |        | F      | 19       |
| 48       |            |    | v<br>I |        | I      | S      | A                      | I      | G      | L      | 19       |
| 49       | 208        |    | s      | G<br>F | L      | D      | <u>s</u>               | L      | L      | I<br>L | 19       |
|          | 216        |    | s<br>Y |        |        | Y      | <u>r</u>               | L      | I      |        | 19       |
| 50       | 219        |    |        | ь      | L      | I      | <u>L</u>               | K      | Т      | V      | ; 19     |
| 51       | 221        |    | L      | I      | L      | K      | T                      | V      | L      | G      | 19       |
| 52       | 223        |    | L      | K      | T      | V      | <u>L</u>               | G      | L      | T      | 19       |
| 53<br>54 | 17         |    | G      | L<br>S | P      | G      | <u>r</u>               | E      | E      | A      | 18       |
| 54<br>55 | 33         |    | c<br>s |        | L      | Y      | <u>r</u>               | I      | A      | V      | 18       |
|          | 34         |    |        | L      | Y      | L      | I                      | A      | V      | L      | 18       |
| 56<br>57 | 38<br>43   |    | I      | A<br>L | V      | L      | G                      | N      | L      | T<br>V | 18       |
| 58       |            |    | N<br>I | F      | T      | I      | I                      | Y      | I      |        | 18       |
|          | 85         |    | A      | M      | W<br>A | F      | N                      | S      | T      | T<br>V | 18       |
| 59<br>60 | 118        |    | R      | V      | N      | F      | D                      | R<br>Y | Y<br>G |        | 18       |
| 61       | 194        |    | L      | v<br>D |        | V      | V                      |        | S      | L<br>F | 18       |
| 62       | 210        |    |        |        | S<br>F | L      | F.                     | I      |        |        | 18       |
| 63       | 215        |    | C      | S<br>A |        | S      | Y                      | L      | L      | I<br>V | 18       |
| 64       | 246<br>254 |    | P      | F      | V      | F      | I                      | F<br>S | Y<br>M | v      | 18       |
| 65       | 15         |    | L      | I      | G      | G<br>L | $\overline{\Gamma}$    |        | L      |        | 18       |
| 66       | 63         |    | F      | L      | C      | М      | P<br>L                 | G<br>S |        | E      | 17       |
| 67       |            |    |        |        |        |        |                        |        | G      |        | 17       |
| 68       | 72<br>93   |    | I<br>I | L      | I      | S      | $\frac{\mathbf{T}}{2}$ | S      | S      | M      | 17       |
|          |            |    |        | Q      | F      | D      | A                      | C      | L      | L      | 17       |
| 69       | 98         |    | C      | L      | L      | Q      | Ī                      | F      | A      | I      | 17       |
| 70<br>71 | 111        |    | M<br>N | E      | S      | Т      | <u>v</u>               | L      | L      | A      | 17       |
| 71       | 120        |    | A.     | F      | D      | R      | Y                      | V      | A      | I      | 17       |
| 72       | 167        | _  | L      | P      | F      | C      | R                      | S      | N      | I      | 17       |
| 73       | 197        |    | V      | V      | Y      | G      | L                      | I      | V      | I      | 17       |
| 74       | 226        |    | V<br>• | L      | G      | L      | T                      | R      | E      | A      | 17       |
| 75<br>76 | 281        |    | L      | L      | V      | P      | <u>P</u>               | V      | L      | N      | 17       |
| 76       | 31         | F: | P      | L      | С      | s      | $\bar{\Gamma}$         | Y      | L      | Ι      | 16<br>62 |
|          |            |    |        |        |        |        |                        |        |        |        | 62       |

HLA-A\*0201 nonomers (SEQ ID NOS 1463-1569, respectively in order of appearance)

|   |     |     |   |   |   |   | / |                                      |   |              |   |       |
|---|-----|-----|---|---|---|---|---|--------------------------------------|---|--------------|---|-------|
|   |     | Pos | 1 | 2 | 3 | 4 | 5 | 6                                    | 7 | 8            | 9 | score |
|   | 77  | 56  | S | L | Н | E | P | M                                    | Y | 1            | F | 16    |
|   | 78  | 70  | G | I | D | I | L | Ī                                    | S | T            | S | 16    |
|   | 79  | 78  | s | s | M | P | K | M                                    | L | Α            | I | 16    |
|   | 80  | 79  | S | M | P | K | М | L                                    | Α | Ι            | F | 16    |
|   | 81  | 104 | F | A | I | Н | s | Ē                                    | S | G            | M | 16    |
|   | 82  | 119 | Α | M | Α | F | D | R                                    | Y | V            | A | 16    |
|   | 83  | 144 | Т | ĸ | I | G | v | A                                    | A | V            | v | 16    |
|   | 84  | 147 | G | v | A | A | V | V                                    | R | G            | A | 16    |
|   | 85  | 186 | v | M | ĸ | L | Α | $\underline{C}$                      | D | D            | I | 16    |
|   | 86  | 230 | L | T | R | E | Α | Q                                    | A | K            | A | 16    |
|   | 87  | 238 | Α | F | G | T | С | V                                    | S | Н            | v | 16    |
|   | 88  | 249 | v | F | I | F | Y | $\underline{v}$                      | P | F            | I | 16    |
|   | 89  | 302 | Q | R | I | L | R | $\overline{\Gamma}$                  | F | Н            | v | 16    |
|   | 90  | 303 | R | I | L | R | L | $\underline{\mathbf{F}}$             | Н | V            | A | 16    |
|   | 91  | 18  | G | L | P | G | L | $\underline{\mathbf{E}}$             | E | A            | Q | 15    |
|   | 92  | 35  | S | L | Y | L | I | <u>A</u>                             | V | L            | G | 15    |
|   | 93  | 42  | L | G | N | L | T | Ī                                    | I | Y            | I | 15    |
|   | 94  | 46  | T | I | Ι | Y | Ι | V                                    | R | T            | E | 15    |
|   | 95  | 69  | s | G | Ι | D | I | $\overline{\mathbf{L}}$              | Ι | S            | T | 15    |
|   | 96  | 76  | S | T | S | S | М | $\underline{\mathtt{P}}$             | K | M            | L | 15    |
|   | 97  | 131 | P | L | R | Н | Α | $\underline{\underline{\mathbf{T}}}$ | V | L            | T | 15    |
|   | 98  | 137 | v | L | Т | L | Ρ | $\underline{R}$                      | V | T            | K | 15    |
|   | 99  | 153 | R | G | Α | Α | L | $\underline{\underline{M}}$          | Α | P            | L | 15    |
| 1 | 00  | 190 | Α | C | D | D | I | $\underline{\mathtt{R}}$             | V | N            | ν | 15    |
| 1 | 01  | 191 | С | D | D | I | R | $\underline{v}$                      | N | V            | V | 15    |
| 1 | .02 | 204 | v | I | 1 | S | A | Ī                                    | G | $\mathbf{L}$ | D | 15    |
| 1 | .03 | 241 | T | C | V | S | Н | $\overline{\Lambda}$                 | С | Α            | v | 15    |
| 1 | .04 | 251 | I | F | Y | V | P | F                                    | Ι | G            | L | 15    |
| 1 | .05 | 269 | R | D | S | P | L | <u>P</u>                             | V | 1            | L | 15    |
| 1 | .06 | 280 | I | Y | L | L | V | $\underline{\underline{P}}$          | P | V            | L | 15    |
| 1 | 07  | 306 | R | L | F | Н | V | A                                    | Т | Н            | A | 15    |
|   |     |     |   |   |   |   |   |                                      |   |              |   |       |

### NOS 1570-1594, respectively in order of appearance)

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| 9   |
| 9   |
| 9   |
| 63  |
|     |

HLA A\*0203 nonomers (SEQ ID NOS 1570-1594, respectively in order of appearance)

|    | Pos | 1            | 2                                    | 3 | 4 | 5            | 6 | 7                        | Я | 9 | score |
|----|-----|--------------|--------------------------------------|---|---|--------------|---|--------------------------|---|---|-------|
| 13 | 113 |              | s                                    |   |   |              |   |                          |   |   | 9     |
| 14 | 141 | P            | R                                    | v | Т | K            | Ι | G                        | v | A | 9     |
| 15 | 142 | R            | v                                    | T | K | Ι            | G | v                        | Α | A | 9     |
| 16 | 151 |              | V                                    |   |   |              |   |                          |   |   | 9     |
| 17 | 182 | L            | Н                                    | Q | D | ٧            | M | K                        | L | A | 9     |
| 18 | 200 | Y            | G                                    | L | I | V            | I | Ī                        | S | A | 9     |
| 19 | 226 | $\mathbf{T}$ | $\overline{\Lambda}$                 | L | G | L            | Т | R                        | E | A | 9     |
| 20 | 228 | L            | G                                    | L | Т | R            | E | A                        | Q | A | 9     |
| 21 | 230 | L            | $\underline{\mathbf{T}}$             | R | E | A            | Q | A                        | K | A | 9     |
| 22 | 240 | G            | $\underline{\underline{\mathbf{T}}}$ | С | V | S            | Н | $\underline{\mathtt{v}}$ | C | A | 9     |
| 23 | 270 | D            | s                                    | P | L | P            | V | <u>1</u>                 | L | A | 9     |
| 24 | 303 | R            | I                                    | L | R | $\mathbf{L}$ | F | H                        | V | A | 9     |
| 25 | 306 | R            | $\underline{\mathbf{L}}$             | F | Н | V            | Α | $\underline{\mathbf{T}}$ | H | A | . 9   |
|    |     |              |                                      |   |   |              |   |                          |   |   |       |

### HLA-A26 nonomers (SEQ ID NOS 1595-1675, respectively in order of appearance)

|    | Pos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8            | 9 | score |
|----|-----|---|---|---|---|---|---|---|--------------|---|-------|
| 1  | 299 | E | I | R | 0 | R | I | L | R            | L | 30    |
| 2  | 72  | D | T | L | I | s | T | s | s            | М | 27    |
| 3  | 248 | A | v | F | I | F | Y | v | P            | F | 27    |
| 4  | 210 | G | L | D | s | L | L | I | s            | F | 26    |
| 5  | 14  | F | I | L | I | G | L | P | G            | L | 24    |
| 6  | 56  | s | L | Н | Е | P | М | Y | I            | F | 24    |
| 7  | 117 | L | L | А | М | Α | F | D | R            | Y | 24    |
| 8  | 222 | L | I | L | K | Т | v | L | G            | L | 24    |
| 9  | 245 | Н | v | С | Α | v | F | Ι | F            | Y | 24    |
| 10 | 11  | А | Т | Y | F | I | L | I | G            | L | 23    |
| 11 | 37  | Y | L | Ι | А | v | L | G | N            | L | 23    |
| 12 | 114 | s | Т | V | L | L | Α | M | Α            | F | 23    |
| 13 | 156 | Α | L | M | Α | P | L | Р | V            | F | 23    |
| 14 | 162 | P | v | F | I | K | Q | L | P            | F | 23    |
| 15 | 181 | С | L | Н | Q | D | v | M | ĸ            | L | 23    |
| 16 | 28  | W | L | Α | F | P | L | С | S            | L | 22    |
| 17 | 92  | T | T | Ι | Q | F | D | Α | С            | L | 22    |
| 18 | 160 | P | L | P | V | F | I | K | Q            | L | 22    |
| 19 | 203 | I | V | Ι | Ι | s | Α | Ι | G            | L | 22    |
| 20 | 213 | s | L | L | I | s | F | s | Y            | L | 22    |
| 21 | 275 | V | Ι | L | Α | N | I | Y | $\mathbf{L}$ | L | 22    |
| 22 | 193 | D | I | R | V | N | v | v | Y            | G | 21    |
| 23 | 242 | C | V | s | Н | V | С | A | V            | F | 21    |
| 24 | 76  | S | T | s | S | М | P | K | M            | L | 20    |
| 25 | 253 | Y | V | P | F | I | G | L | s            | М | 20    |
| 26 | 274 | P | V | Ι | L | A | N | I | Y            | L | 20    |
| 27 | 23  | E | E | A | Q | F | W | L | Α            | F | 19    |
| 28 | 41  | v | L | G | N | L | T | 1 | I            | Y | 19    |
| 29 | 49  | Y | I | V | R | T | E | Н | s            | L | 19    |
| 30 | 150 | Α | V | V | R | G | A | A | L            | М | 19    |
|    |     |   |   |   |   |   |   |   |              | ſ | 64    |

HLA-A26 nonomers (SEQ ID NOS 1595-1675, respectively in order of appearance)

|    | Pos      | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9  | score |
|----|----------|---|---|----|---|---|---|---|---|----|-------|
| 31 | 174      | N | ī | L  | s | Н | s | Y | C | L  | 19    |
| 32 | 192      | D | D | I  | R | v | N | v | v | Y  | 19    |
| 33 | 214      | L | L | I  | s | F | s | Y | L | L  | 19    |
| 34 | 251      | I | F | Y  | v | P | F | I | G | L  | 19    |
| 35 | 8        | E | s | s  | A | Т | Y | F | I | L  | 18    |
| 36 | 21       | G | L | E  | E | Ā | Q | F | W | L  | 18    |
| 37 | 45       | L | Т | I  | I | Y | I | v | R | Т  | 18    |
| 38 | 54       | E | Н | s  | L | Н | E | P | М | Y  | 18    |
| 39 | 59       | E | P | М  | Y | I | F | L | C | М  | 18    |
| 40 | 88       | W | F | N  | s | T | Т | I | Q | F  | 18    |
| 41 | 93       | т | I | 0  | F | D | A | C | L | L  | 18    |
| 42 | 185      | D | v | M  | ĸ | L | A | C | D | D  | 18    |
| 43 | 198      | v | v | Y  | G | L | I | v | I | I  | 18    |
| 44 | 62       | Y | I | F  | L | С | М | L | s | G  | 17    |
| 45 | 70       | G | I | D  | I | L | I | S | T | s  | 17    |
| 46 | 70<br>79 | s | м | P  | ĸ | М | L | A | Ι | F  | 17    |
| 47 | 96       | F | D | A  | C | L | L | Q | I | F  | 17    |
| 48 | 104      | F | A | I  | Н | s | L | S | G | М  | 17    |
| 49 | 138      | L | Т | L  | P | R | V | Т | К | I  | 17    |
| 50 | 143      | V | Т | К  | I | G | v | A | A | v  | 17    |
| 51 | 204      | V | I | I  | s | A | I | G | Ь | D  | 17    |
| 52 | 212      | D | s | L  | L | I | s | F | s | Y  | 17    |
| 53 | 220      | Y | L | L  | I | L | K | Т | v | L  | 17    |
| 54 | 256      | F | I | G  | L | S | M | V | Н | R  | 17    |
| 55 | 283      | L | v | P  | Р | V | L | N | P | I  | 17    |
| 56 | 29       | L | A | F  | P | L | С | S | L | Ϋ́ | 16    |
| 57 | 40       | A | v | L  | G | N | L | T | I | I  | 16    |
| 58 | 46       | Т | I | I  | Y | I | v | R | Т | E  | 16    |
| 59 | 52       | R | Т | E  | Н | s | L | Н | Ē | P  | 16    |
| 60 | 75       | I | s | T  | s | s | м | P | K | М  | 16    |
| 61 | 91       | s | Т | Т  | I | Q | F | D | A | C  | 16    |
| 62 | 135      | A | Т | v  | L | T | L | P | R | v  | 16    |
| 63 | 147      | G | v | A  | A | v | v | R | Ġ | A  | 16    |
| 64 | 201      | G | L | I  | v | I | I | s | A | I  | 16    |
| 65 | 257      | I | G | L  | s | М | v | Н | R | F  | 16    |
| 66 | 279      | N | I | Y  | L | L | v | P | P | v  | 16    |
| 67 | 30       | A | F | P  | L | C | s | L | Y | L  | 15    |
| 68 | 101      | L | Q | I  | F | A | I | Н | s | L  | 15    |
| 69 | 115      | Т | v | L  | L | A | M | A | F | D  | 15    |
| 70 | 127      | A | Ι | C  | Н | P | L | R | H | A  | 15    |
| 71 | 153      | R | G | A  | A | L | М | Α | P | L  | 15    |
| 72 | 163      | v | F | I  | K | Q | L | P | F | C  | 15    |
| 73 | 215      | L | I | s  | F | s | Y | L | L | I  | 15    |
| 74 | 216      | I | s | F  | s | Y | L | L | I | L  | 15    |
| 75 | 225      | K | T | v  | L | G | L | Т | R | E  | 15    |
| 76 | 272      | P | L | P  | V | I | L | A | N | I  | 15    |
| 77 | 282      | L | L | v  | P | P | v | L | N | P  | 15    |
| 78 | 286      | P | v | L  | N | P | I | v | Y | G  | 15    |
| 79 | 287      | v | L | N  | P | I | v | Y | G | v  | 15    |
|    | -5.      | ٧ | _ | -• | - | _ | • | _ | J | •  | 65    |
|    |          |   |   |    |   |   |   |   |   |    | 0.5   |

### HLA-A26 nonomers (SEQ ID NOS 1595-1675, respectively in order of appearance)

|    | Pos | 1 | 2 | 3  | 4 | 5  | 6 | 7 | 8 | 9 | score |
|----|-----|---|---|----|---|----|---|---|---|---|-------|
| 80 | 296 | K | Т | K  | E | I  | R | Q | R | 1 | 15    |
| 81 | 303 | R | Т | т. | R | T. | F | н | v | Α | 15    |

#### HLA-A3 nonomers(SEQ ID NOS 1676-1747, respectively in order of appearance)

|    | Pos   | 1 | 2 | 3                           | 4 | 5 | 6                        | 7                           | 8 | 9 | score |
|----|-------|---|---|-----------------------------|---|---|--------------------------|-----------------------------|---|---|-------|
| 1  | 137   | v | L | т                           | L | P | R                        | v                           | т | ĸ | 30    |
| 2  | 229   | G | L | Ť                           | R | E | A                        | Q                           | A | ĸ | 27    |
| 3  | 145   | к | ī | Ġ                           | V | A | A                        | v                           | v | R | 26    |
| 4  | 150   | A | v | v                           | R | G | A                        | Ā                           | L | M | 24    |
| 5  | 290   | P | I | v                           | Y | G | V                        | K                           | Т | K | 24    |
| 6  | 35    | s | L | Ÿ                           | L | Ι | Ă                        | v                           | L | G | 23    |
| 7  | 156   | A | L | M                           | A | P | L                        | P                           | v | F | 23    |
| 8  | 47    | I | I | Y                           | I | v | ≓<br>R                   | T                           | E | H | 22    |
| 9  | 50    | ī | v | -<br>R                      | Т | E | H                        | s                           | L | н | 22    |
| 10 | 142   | R | v | T                           | ĸ | I | G                        | v                           | A | A | 22    |
| 11 | 151   | v | v | R                           | G | A | A                        | L                           | М | A | 22    |
| 12 | 242   | C | v | S                           | Н | V | C                        | =<br>A                      | v | F | 22    |
| 13 | 248   | A | v | F                           | I | F | Y                        | v                           | P | F | 22    |
| 14 | 116   | v | L | L                           | A | М | <del>-</del><br>A        | F                           | D | R | 21    |
| 15 | 192   | D | D | I                           | R | v | N                        | v                           | v | Y | 21    |
| 16 | 303   | R | I | L                           | R | L | F                        | H                           | v | A | 21    |
| 17 | 304   | I | L | =<br>R                      | L | F | H                        | v                           | A | т | 21    |
| 18 | 108   | S | L | s                           | G | М | E                        | s                           | Т | V | 20    |
| 19 | 198   | V | v | _<br>Y                      | G | L | ī                        | v                           | I | I | 20    |
| 20 | 291   | I | v | Y                           | G | v | K                        | T                           | К | E | 20    |
| 21 | 15    | I | L | Ī                           | G | L | P                        | G                           | L | E | 19    |
| 22 | 44    | N | L | T                           | Ι | r | Y                        | I                           | v | R | 19    |
| 23 | 73    | I | L | I                           | s | Т | s                        | s                           | М | P | 19    |
| 24 | 74    | L | I | s                           | Т | s | s                        | M                           | P | ĸ | 19    |
| 25 | 99    | C | L | L                           | Q | Ι | F                        | A                           | Ι | н | 19    |
| 26 | 162   | P | v | F                           | Ι | K | Q                        | L                           | P | F | 19    |
| 27 | 203   | I | v | Ī                           | Ι | s | A                        | I                           | G | L | 19    |
| 28 | 221 · | L | L | Ī                           | L | K | T                        | V                           | L | G | 19    |
| 29 | 245   | Н | v | C                           | A | V | <u>F</u>                 | I                           | F | Y | 19    |
| 30 | 306   | R | L | F                           | Н | V | A                        | $\underline{\mathbf{T}}$    | Н | A | 19    |
| 31 | 40    | Α | v | <u>L</u>                    | G | N | $\underline{\mathbf{L}}$ | $\underline{\mathbf{T}}$    | I | I | 18    |
| 32 | 85    | Α | I | $\underline{\mathbf{F}}$    | W | F | <u>N</u>                 | $\underline{s}$             | T | T | 18    |
| 33 | 205   | I | I | <u>s</u>                    | A | I | $\underline{\mathbf{G}}$ | Ŀ                           | D | s | 18    |
| 34 | 220   | Y | L | Ī                           | I | L | $\underline{\mathbf{K}}$ | T                           | V | L | 18    |
| 35 | 253   | Y | V | $\underline{\underline{P}}$ | F | Ι | $\underline{\mathbf{G}}$ | $\overline{\mathbf{L}}$     | S | M | 18    |
| 36 | 37    | Y | L | Ī                           | A | V | $\overline{\mathbf{r}}$  | $\underline{\mathbf{G}}$    | N | L | 17    |
| 37 | 41    | V | L | $\underline{G}$             | N | L | $\underline{\mathtt{T}}$ | Ī                           | I | Y | 17    |
| 38 | 117   | L | L | $\underline{\underline{A}}$ | M | A | $\underline{\mathbf{F}}$ | $\underline{\mathtt{D}}$    | R | Y | 17    |
| 39 | 131   | P | L | $\underline{\mathbf{R}}$    | H | A | $\underline{{\bf T}}$    | $\underline{\mathtt{v}}$    | L | Т | 17    |
| 40 | 136   | Т | v | $\overline{\Gamma}$         | T | L | <u>P</u>                 | $\underline{\underline{R}}$ | V | T | 17    |
| 41 | 180   | Y | C | $\overline{\mathbf{r}}$     | Н | Q | $\underline{\mathtt{D}}$ | $\overline{\Lambda}$        | M | K | 17    |
|    |       |   |   |                             |   |   |                          |                             |   |   | 66    |

HLA-A3 nonomers (SEQ ID NOS 1676-1747, respectively in order of appearance)

|    | Pos | 1            | 2 | 3                        | 4 | 5 | 6                                    | 7                        | 8 | 9 | score |
|----|-----|--------------|---|--------------------------|---|---|--------------------------------------|--------------------------|---|---|-------|
| 42 | 201 | G            | L | I                        | V | I | Ι                                    | <u>s</u>                 | A | I | 17    |
| 43 | 213 | s            | L | ±<br>L                   | I | s | ÷<br>F                               | S                        | Y | L | 17    |
| 44 | 256 | F            | I | G                        | L | s | M                                    | v                        | Н | R | 17    |
| 45 | 261 | M            | v | H                        | R | F | s                                    | ĸ                        | R | R | 17    |
| 46 | 276 | I            | L | A                        | N | Ī | Y                                    | L                        | L | v | 17    |
| 47 | 281 | Y            | L | L                        | v | P | P                                    | v                        | L | N | 17    |
| 48 | 286 | P            | v | L                        | N | P | Ī                                    | v                        | Y | G | 17    |
| 49 | 288 | L            | N | P                        | I | v | Y                                    | Ġ                        | v | ĸ | 17    |
| 50 | 309 | H            | v | –<br>A                   | Т | Н | Ā                                    | <u>s</u>                 | E | P | 17    |
| 51 | 1   | M            | v | D                        | P | N | G                                    | N                        | E | s | 16    |
| 52 | 56  | S            | L | H                        | E | P | M                                    | Y                        | Ι | F | 16    |
| 53 | 70  | G            | I | D                        | I | L | I                                    | s                        | т | s | 16    |
| 54 | 72  | D            | I | L                        | I | s | T                                    | s                        | s | М | 16    |
| 55 | 115 | Т            | v | L                        | L | Α | M                                    | A                        | F | D | 16    |
| 56 | 125 | Y            | v | A                        | Ι | С | Н                                    | P                        | L | R | 16    |
| 57 | 144 | Т            | ĸ | Ī                        | G | v | A                                    | A                        | v | v | 16    |
| 58 | 167 | Q            | L | P                        | F | С | R                                    | s                        | N | I | 16    |
| 59 | 175 | I            | L | s                        | Н | s | Y                                    | C                        | L | н | 16    |
| 60 | 195 | R            | v | N                        | ٧ | v | Y                                    | G                        | L | I | 16    |
| 61 | 197 | N            | v | v                        | Y | G | L                                    | I                        | v | I | 16    |
| 62 | 210 | G            | L | D                        | S | L | Ŀ                                    | Ī                        | S | F | 16    |
| 63 | 282 | L            | L | <u>v</u>                 | P | P | $\overline{\Lambda}$                 | L                        | N | P | 16    |
| 64 | 299 | E            | I | R                        | Q | R | Ī                                    | Ē                        | R | L | 16    |
| 65 | 301 | R            | Q | R                        | I | L | R                                    | $\overline{\Gamma}$      | F | Н | 16    |
| 66 | 16  | L            | I | G                        | L | P | $\underline{\mathtt{G}}$             | Ē                        | E | E | 15    |
| 67 | 46  | $\mathbf{T}$ | I | Ī                        | Y | Ι | $\underline{\mathtt{v}}$             | $\underline{R}$          | Т | E | 15    |
| 68 | 102 | Q            | I | <u>F</u>                 | A | I | H                                    | $\underline{s}$          | L | s | 15    |
| 69 | 193 | D            | I | R                        | V | N | V                                    | $\overline{\Lambda}$     | Y | G | 15    |
| 70 | 208 | Α            | I | $\underline{\mathbf{G}}$ | L | D | <u>s</u>                             | $\underline{\mathbf{L}}$ | L | I | 15    |
| 71 | 223 | I            | L | $\underline{\textbf{K}}$ | Т | V | $\underline{\underline{\mathbf{r}}}$ | $\underline{G}$          | L | T | 15    |
| 72 | 237 | K            | A | $\underline{\mathbf{F}}$ | G | Т | $\underline{c}$                      | $\underline{\mathtt{v}}$ | S | H | 15    |

## HLA-B\*0702 nonomers (SEQ ID NOS 1748-1812, respectively in order of appearance)

|    | Pos | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | score |
|----|-----|--------------|---|---|---|---|---|---|---|---|-------|
| 1  | 130 | Н            | P | L | R | Н | Α | Т | v | L | 22    |
| 2  | 59  | E            | P | М | Y | I | F | L | С | M | 21    |
| 3  | 168 | L            | P | F | С | R | S | N | I | L | 20    |
| 4  | 289 | N            | P | 1 | V | Y | G | V | K | T | 19    |
| 5  | 3   | D            | P | N | G | N | E | s | s | Α | 18    |
| 6  | 19  | $\mathbf{L}$ | P | G | L | E | E | Α | Q | F | 18    |
| 7  | 140 | L            | P | R | v | Т | K | I | G | v | 18    |
| 8  | 284 | v            | P | P | V | L | N | p | Ι | v | 17    |
| 9  | 31  | F            | P | L | С | s | L | Y | L | I | 16    |
| 10 | 254 | V            | P | F | I | G | L | s | M | v | 16    |
| 11 | 269 | R            | D | S | P | L | P | V | Ι | L | 16    |
| 12 | 149 | Α            | A | V | V | R | G | Α | Α | L | 15    |
|    |     |              |   |   |   |   |   |   |   |   | 67    |

HLA-B\*0702 nonomers (SEQ ID NOS 1748-1812, respectively in order of appearance)

| •  |     |   |   |   |   |   |   |   | _ |   |       |
|----|-----|---|---|---|---|---|---|---|---|---|-------|
|    | Pos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | score |
| 13 | 153 | R | G | Α | Α | L | М | Α | P | L | 15    |
| 14 | 156 | Α | L | М | Α | P | L | P | v | F | 15    |
| 15 | 251 | I | F | Y | v | P | F | I | G | L | 15    |
| 16 | 299 | E | I | R | Q | R | Ι | L | R | L | 15    |
| 17 | 8   | Е | s | s | Ā | т | Y | F | Ι | L | 14    |
| 18 | 28  | W | L | A | F | P | L | С | s | L | 14    |
| 19 | 30  | Α | F | P | L | C | s | L | Y | L | 14    |
| 20 | 110 | S | G | M | E | s | T | v | L | L | 14    |
| 21 | 132 | L | R | Н | A | T | v | L | T | L | 14    |
| 22 | 159 | A | P | L | P | v | F | I | K | Q | 14    |
| 23 | 222 | L | I | L | к | Т | V | L | G | L | 14    |
| 24 | 271 | s | P | L | P | v | I | L | A | N | 14    |
| 25 | 25  | A | Q | F | W | L | A | F | P | L | 13    |
| 26 | 109 | L | s | G | М | E | s | Т | v | L | 13    |
| 27 | 124 | R | Y | v | Α | I | C | Н | P | L | 13    |
| 28 | 216 | I | s | F | s | Y | L | L | I | L | 13    |
| 29 | 268 | R | R | D | s | P | L | P | v | I | 13    |
| 30 | 280 | I | Y | L | L | v | P | P | v | L | 13    |
| 31 | 11  | A | T | Y | F | I | L | I | G | L | 12    |
| 32 | 34  | С | s | L | Y | L | I | A | v | L | 12    |
| 33 | 57  | L | н | E | P | М | Y | I | F | L | 12    |
| 34 | 76  | s | T | s | s | М | P | K | М | L | 12    |
| 35 | 142 | R | v | Т | ĸ | I | G | v | Α | A | 12    |
| 36 | 151 | v | v | R | G | A | Α | L | М | A | 12    |
| 37 | 190 | A | Ċ | D | D | I | R | v | N | v | 12    |
| 38 | 194 | I | R | v | N | v | v | Y | G | L | 12    |
| 39 | 206 | I | s | A | I | G | L | D | S | L | 12    |
| 40 | 207 | s | A | I | G | L | D | s | L | L | 12    |
| 41 | 220 | Y | L | L | I | L | К | Т | v | L | 12    |
| 42 | 267 | ĸ | R | R | D | s | P | L | P | v | 12    |
| 43 | 304 | ī | L | R | L | F | Н | v | Ā | T | 12    |
| 44 | 14  | F | I | L | I | G | L | P | G | L | 11    |
| 45 | 23  | E | E | A | Q | F | W | L | A | F | 11    |
| 46 | 37  | Y | L | Ι | A | v | L | G | N | L | 11    |
| 47 | 40  | A | v | L | G | N | L | Т | I | I | 11    |
| 48 | 77  | т | s | s | М | P | K | М | L | A | 11    |
| 49 | 78  | s | s | M | P | K | М | L | Α | I | 11    |
| 50 | 80  | М | P | K | М | L | Α | Ι | F | W | 11    |
| 51 | 92  | Т | т | Ι | Q | F | D | Α | С | L | 11    |
| 52 | 112 | М | E | s |   | v | L |   | A | M | 11    |
| 53 | 119 | Α | м | A | F | D | R | Y | v | A | 11    |
| 54 | 127 | А | I | С | Н | P | L | R | Н | A | 11    |
| 55 | 131 | P | L | R | Н | A | т | v | L | т | 11    |
| 56 | 155 | A | A | L | М | A | P | L | P | v | 11    |
| 57 | 157 | L | M | A | P | L | P | v | F | I | 11    |
| 58 | 181 | C | L | Н | Q | D | v | М | K | L | 11    |
| 59 | 203 | I | v | I | I | s | A | 1 | G | L | 11    |
| 60 | 208 | A | I | G | L | D | s | L | L | I | 11    |
| 61 | 213 | s | L | L | I | s | F | s | Y | L | 11    |
| _  |     | - | - | _ | - | - |   | - | - | _ | 68    |
|    |     |   |   |   |   |   |   |   |   |   | 00    |

### HLA-B\*0702 nonomers (SEQ ID NOS 1748-1812, respectively in order of appearance)

|    | Pos |   |   | score |    |   |   |   |   |   |       |
|----|-----|---|---|-------|----|---|---|---|---|---|-------|
|    | FUS | 1 | 2 | 3     | 4  | 5 | 6 | 7 | 8 | 9 | SCOLE |
| 62 | 248 | Α | v | F     | Ι  | F | Y | V | Р | F | 11    |
| 63 | 265 | F | S | K     | R  | R | D | S | P | L | 11    |
| 64 | 275 | v | I | L     | Α  | N | Ι | Y | L | L | 11    |
| 65 | 285 | P | P | v     | τ. | N | Р | т | v | Y | 11    |

### HLA-B\*08 nonomers (SEQ ID NOS 1813-1847, respectively in order of appearance)

|    | Pos | 1            | 2            | 3 | 4 | 5 | 6            | 7 | 8 | 9 | score |
|----|-----|--------------|--------------|---|---|---|--------------|---|---|---|-------|
| 1  | 299 | E            | I            | R | Q | R | Ι            | L | R | L | 31    |
| 2  | 265 | F            | s            | K | R | R | D            | S | P | L | 29    |
| 3  | 149 | Α            | Α            | v | V | R | G            | Α | Α | L | 24    |
| 4  | 168 | L            | P            | F | C | R | S            | N | Ι | L | 24    |
| 5  | 294 | G            | V            | K | T | K | E            | Ι | R | Q | 21    |
| 6  | 120 | М            | Α            | F | D | R | Y            | V | Α | I | 20    |
| 7  | 292 | v            | Y            | G | V | K | Т            | K | E | I | 20    |
| 8  | 21  | G            | L            | E | E | A | Q            | F | W | L | 19    |
| 9  | 78  | s            | S            | M | p | K | М            | L | A | I | 19    |
| 10 | 160 | P            | L            | P | ٧ | F | I            | K | Q | L | 19    |
| 11 | 186 | V            | M            | K | L | A | С            | D | D | I | 18    |
| 12 | 213 | S            | L            | L | I | S | F            | S | Y | L | 18    |
| 13 | 221 | L            | L            | I | L | K | Т            | V | L | G | 18    |
| 14 | 296 | K            | $\mathbf{T}$ | ĸ | E | I | R            | Q | R | I | 18    |
| 15 | 297 | T            | K            | E | Ι | R | Q            | R | Ι | L | 18    |
| 16 | 130 | Н            | P            | L | R | H | Α            | T | V | L | 17    |
| 17 | 181 | С            | L            | H | Q | D | V            | M | K | L | 17    |
| 18 | 223 | I            | L            | ĸ | T | v | $\mathbf{L}$ | G | L | T | 17    |
| 19 | 28  | W            | L            | A | F | P | L            | C | S | L | 16    |
| 20 | 37  | Y            | L            | I | A | V | L            | G | N | L | 16    |
| 21 | 56  | S            | L            | н | E | P | М            | Y | Ι | F | 16    |
| 22 | 80  | М            | P            | K | М | L | A            | I | F | W | 16    |
| 23 | 162 | P            | V            | F | Ι | K | Q            | L | P | F | 16    |
| 24 | 201 | G            | L            | I | V | I | I            | S | A | I | 16    |
| 25 | 207 | S            | Α            | I | G | L | D            | S | L | L | 16    |
| 26 | 214 | L            | L            | I | S | F | S            | Y | L | L | 16    |
| 27 | 220 | Y            | L            | L | Ι | L | K            | Т | v | L | 16    |
| 28 | 233 | E            | Α            | Q | A | K | A            | F | G | T | 16    |
| 29 | 275 | v            | Ι            | L | Α | N | I            | Y | L | L | 16    |
| 30 | 304 | I            | L            | R | L | F | Н            | V | A | T | 16    |
| 31 | 14  | F            | I            | L | I | G | L            | P | G | L | 15    |
| 32 | 110 | S            | G            | M | E | S | Т            | V | L | L | 15    |
| 33 | 138 | $\mathbf{L}$ | T            | L | P | R | V            | Т | K | I | 15    |
| 34 | 164 | F            | Ι            | K | Q | L | P            | F | С | R | 15    |
| 35 | 222 | L            | I            | L | K | T | V            | L | G | L | 15    |
|    |     |              |              |   |   |   |              |   |   |   |       |

HLA-B\*1510 nonomers (SEQ ID NOS 1848-1890, respectively in order of appearance)

|     | Pos |        |               | _      |        | _      | _      | _      | •      | •      | score    |
|-----|-----|--------|---------------|--------|--------|--------|--------|--------|--------|--------|----------|
| 1   | 57  | 1<br>L | 2<br><b>H</b> | 3<br>E | 4<br>P | 5<br>M | 6<br>Y | 7<br>I | 8<br>F | 9<br>L | 23       |
| 2   | 244 | S      | н             | v      | C      | A      | V      | F      | I      | F      | 23<br>17 |
| 3   | 269 | R      | D             | s      | P      | L      | v<br>P | v      | I      | L      | 16       |
| 4   | 280 | I      | Y             | L      | L      | A<br>P | P      | P      | v      | L      | 16       |
| 5   | 262 | v      | н             | R      | F      | s      | K      | R      | R      | D      | 15       |
| 6   | 299 | E      | ı             | R      | Q      | R      | I      | L      | R      | L      | 15       |
| 7   | 106 | I      | н             | S      | L      | S      | G      | М      | E      | S      | 14       |
| . 8 | 206 | I      | s             | A      | I      | G      | L      | D      | s      | L      | 14       |
| 9   | 220 | Y      | L             | L      | I      | L      | K      | Т      | v      | L      | 14       |
| 10  | 251 | I      | F             | Y      | v      | P      | F      | I      | G      | L      | 14       |
| 11  | 297 | Т      | ĸ             | E      | I      | R      | Q      | R      | I      | L      | 14       |
| 12  | 21  | G      | L             | E      | E      | A      | ō      | F      | W      | L      | 13       |
| 13  | 34  | C      | s             | L      | Y      | L      | I      | A      | v      | L      | 13       |
| 14  | 54  | E      | н             | s      | L      | Н      | E      | P      | М      | Y      | 13       |
| 15  | 110 | s      | G             | М      | Ε      | s      | Т      | V      | L      | L      | 13       |
| 16  | 194 | I      | R             | v      | N      | V      | v      | Y      | G      | L      | 13       |
| 17  | 8   | Е      | s             | s      | Α      | Т      | Y      | F      | Ι      | L      | 12       |
| 18  | 14  | F      | 1             | L      | Ι      | G      | L      | Р      | G      | L      | 12       |
| 19  | 28  | W      | L             | Α      | F      | P      | L      | С      | s      | L      | 12       |
| 20  | 66  | С      | M             | L      | s      | G      | I      | D      | I      | L      | 12       |
| 21  | 76  | S      | T             | s      | s      | М      | P      | K      | М      | L      | 12       |
| 22  | 92  | T      | T             | I      | Q      | F      | D      | Α      | С      | L      | 12       |
| 23  | 109 | L      | s             | G      | M      | E      | S      | T      | V      | L      | 12       |
| 24  | 130 | Н      | P             | L      | R      | Н      | Α      | T      | V      | L      | 12       |
| 25  | 132 | L      | R             | Н      | Α      | T      | V      | L      | T      | L      | 12       |
| 26  | 149 | A      | A             | V      | V      | R      | G      | A      | A      | L      | 12       |
| 27  | 153 | R      | G             | A      | A      | L      | M      | Α      | P      | L      | 12       |
| 28  | 160 | P      | L             | P      | V      | F      | Ι      | K      | Q      | L      | 12       |
| 29  | 181 | C      | L             | Н      | Q      | D      | V      | M      | K      | L      | 12       |
| 30  | 182 | L      | Н             | Q      | D      | V      | M      | K      | L      | A      | 12       |
| 31  | 203 | 1      | v             | I      | Ι      | S      | A      | Ι      | G      | L      | 12       |
| 32  | 216 | I      | s             | F      | S      | Y      | Ļ      | L      | Ι      | L      | 12       |
| 33  | 222 | L      | I             | L      | K      | Т      | V      | L      | G      | L      | 1.2      |
| 34  | 275 | V      | Ι             | L      | A      | N      | Ι      | Y      | L      | L      | 12       |
| 35  | 37  | Y      | L             | Ι      | A      | V      | L      | G      | N      | L      | 11       |
| 36  | 49  | Υ      | I             | V      | R      | T      | E      | H      | S      | L      | 11       |
| 37  | 93  | T      | I             | Q      | F      | D      | A<br>- | С      | L      | L      | 11       |
| 38  | 101 | L      | Q             | I      | F      | A      | I      | H      | S      | L      | 11       |
| 39  | 129 | C      | Н             | P      | L      | R      | H      | A      | Т      | v      | 11       |
| 40  | 133 | R      | H             | A      | T      | V      | L      | T      | L      | P      | · 11     |
| 41  | 177 | s<br>s | H<br>A        | S      | Y      | C      | Г      | Н      | Q      | D      | 11       |
| 42  | 207 | S      |               | I      | G      | L      | D      | S      | L      | L      | 11       |
| 43  | 257 | . 1    | G             | L      | s      | M      | V      | Н      | R      | F      | 11       |

## HLA-B\*2705 nonomers (SEQ ID NOS 1891-2008, respectively in order of appearance)

|   | Pos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8            | 9 | score |
|---|-----|---|---|---|---|---|---|---|--------------|---|-------|
| 1 | 194 | I | R | V | N | V | V | Y | G            | L | 25    |
| 2 | 268 | R | R | D | S | P | L | P | V            | I | 24    |
| 3 | 132 | L | R | Н | Α | T | v | L | $\mathbf{T}$ | L | 23    |
|   |     |   |   |   |   |   |   |   |              |   | 70    |

HLA-B\*2705 nonomers (SEQ ID NOS 1891-2008, respectively in order of appearance)

| •        |           |        |        |   |   |        |   |   | _  |   |       |
|----------|-----------|--------|--------|---|---|--------|---|---|----|---|-------|
|          | Pos       | 1      | 2      | 3 | 4 | 5      | 6 | 7 | 8  | 9 | score |
| 4        | 300       | ī      | R      | Q | R | I      | L | R | L  | F | 23    |
| 5        | 305       | L      | R      | L | F | Н      | v | A | Т  | Н | 23    |
| 6        | 231       | т      | R      | E | A | Q      | A | К | A  | F | 21    |
| 7        | 34        | C      | s      | L | Y | L      | I | A | V  | L | 18    |
| 8        | 299       | E      | I      | R | Q | R      | I | L | R  | L | 18    |
| 9        | 6         | G      | N      | E | s | s      | A | Т | Y  | F | 17    |
| 10       | 66        | C      | M      | L | s | G      | I | D | I  | L | 17    |
| 11       | 162       | P      | v      | F | I | К      | ō | L | P  | F | 17    |
| 12       | 207       | s      | A      | I | G | L      | D | s | L  | L | 17    |
| 13       | 210       | G      | L      | D | s | L      | L | I | s  | F | 17    |
| 14       | 220       | Y      | L      | L | I | L      | K | Т | v  | L | 17    |
| 15       | 237       | ĸ      | A      | F | G | Т      | C | v | s  | н | 17    |
| 16       | 269       | R      | D      | s | P | L      | P | v | I  | L | 17    |
| 17       | 280       | I      | Y      | L | L | v      | P | P | v  | L | 17    |
| 18       | 295       | v      | ĸ      | Т | K | E      | I | R | o. | R | 17    |
| 19       | 11        | A      | T      | Y | F | I      | L | I | G  | L | 16    |
| 20       | 14        | F      | ī      | L | I | G      | L | P | G  | L | 16    |
| 21       | 21        | G      | L      | E | E | A      | Q | F | W  | ь | 16    |
| 22       | 25        | A      | Õ      | F | W | L      | A | F | P  | L | 16    |
| 23       | 37        | Y      | L      | I | A | A<br>P | L | G | N  | L | 16    |
| 24       |           | , T    | Т      | I |   | v<br>F |   |   |    |   |       |
|          | 92<br>101 | L      |        | I | Q |        | D | A | С  | L | 16    |
| 25       |           |        | Q<br>Y |   | F | A      | I | Н | S  | L | 16    |
| 26       | 124       | R      |        | V | A | I      |   | Н | P  | L | 16    |
| 27       | 130       | Н      | P      | L | R | H      | A | T | ٧  | L | 16    |
| 28       | 141       | P      | R      | V | T | K      | I | G | V  | A | 16    |
| 29       | 153       | R      | G      | A | A | L      | M | A | P  | L | 16    |
| 30       | 181       | C      | r      | H | Q | D      | V | M | K  | L | 16    |
| 31       | 201       | G      | L      | I | V | Ι      | I | S | A  | I | 16    |
| 32       | 203       | I      | V      | I | Ι | S      | A | I | G  | L | 16    |
| 33       | 216       | I      | S      | F | S | Y      | L | L | I  | L | 16    |
| 34       | 222       | L      | I      | L | K | T      | V | L | G  | L | 16    |
| 35       | 255       | P      | F      | I | G | L      | S | M | V  | Н | 16    |
| 36       | 257       | I<br>V | G      | L | S | M      | V | Н | R  | F | 16    |
| 37       | 275       |        | I      | L | A | N      | Ι | Y | L  | L | 16    |
| 38       | 47        | I      | I      | Y | I | V      | R | Т | E  | H | 15    |
| 39       | 109       | L      | S      | G | M | E      | S | T | V  | L | 15    |
| 40<br>41 | 114       | S      | T      | V | L | L      | A | M | A  | F | 15    |
|          | 123       | D      | R      | Y | V | A      | I | C | H  | P | 15    |
| 42       | 145       | K      | I      | G | V | A      | A | V | V  | R | 15    |
| 43       | 156       | A      | L      | M | A | P      | L | P | V  | F | 15    |
| 44       | 168       | L      | P      | F | C | R      | s | N | Ι  | L | 15    |
| 45       | 172       | R      | S      | N | I | L      | S | Н | S  | Y | 15    |
| 46       | 198       | V      | V      | Y | G | L      | Ι | V | Ι  | I | 15    |
| 47       | 206       | I      | S      | A | I | G      | L | D | S  | L | 15    |
| 48       | 229       | G      | L      | T | R | E      | A | Q | A  | K | 15    |
| 49       | 248       | A      | v      | F | 1 | F      | Y | V | P  | F | 15    |
| 50       | 251       | I      | F      | Y | V | P      | F | I | G  | L | 15    |
| 51       | 274       | P      | v      | I | L | A      | N | I | Y  | L | 15    |
| 52       | 290       | P      | Ι      | V | Y | G      | V | K | Т  | K | 15    |
|          |           |        |        |   |   |        |   |   |    |   | 71    |

HLA-B\*2705 nonomers(SEQ ID NOS 1891-2008, respectively in order of appearance)

|       | Pos  | 1 | 2 | 3 | 4  | 5 | 6 | 7   | 8 | 9 | score |
|-------|------|---|---|---|----|---|---|-----|---|---|-------|
| 53    | 298  | K | E | I | R  | Q | R | I   | L | R | 15    |
| 54    | 19   | L | P | G | L  | E | E | A   | 0 | F | 14    |
| 55    | 29   | L | A | F | P  | L | c | s   | L | Y | 14    |
| 56    | 30   | A | F | P | L  | C | s | L   | Y | L | 14    |
| 57    | 39   | 1 | A | v | L  | G | N | L   | T | I | 14    |
| 58    | 40   | A | v | L | G  | N | L | Т   | I | I | 14    |
| 59    | 79   | s | м | P | к  | М | L | A   | I | F | 14    |
| 60    | 81   | P | K | М | L  | A | I | F   | W | F | 14    |
| 61    | 99   | C | L | L | Q  | I | F | A   | I | Н | 14    |
| 62    | 137  | v | L | Т | L  | P | R | V   | Т | ĸ | 14    |
| 63    | 138  | L | т | L | Р  | R | V | T   | K | ľ | 14    |
| 64    | 150  | A | v | v | R  | G | A | A   | L | м | 14    |
| 65    | 160  | P | L | P | V  | F | I | K   | Ö | L | 14    |
| 66    | 174  | N | I | L | s  | Н | s | Y   | C | L | 14    |
| 67    | 180  | Y | C | L | Н  | Q | D | v   | М | K | 14    |
| 68    | 192  | D | D | I | R  | V | N | v   | V | Y | 14    |
| 69    | 212  | D | s | L | L  | I | S | F   | s | Y | 14    |
| 70    | 213  | S | L | L | I  | s | F | s   | Y | L | 14    |
| 71    | 214  | L | L | I | s  | F | S | Y   | L | L | 14    |
| 72    | 260  | S | м | V | Н  | R | F | s   | К | R | 14    |
| 73    | 263  | Н | R | F | S  | K | R | R   | D | S | 14    |
| 74    | 267  | K | R | R | D  | S | P | L   | P | v | 14    |
| 75    | 293  | Y | G | V | K  | Т | K | Е   | I | R | 14    |
| 76    | 301  | R | Q | R | I  | L | R | L   | F | Н | 14    |
| 77    | 302  | 0 | R | I | L  | R | L | F   | Н | v | 14    |
| 78    | 5    | N | G | N | Е  | s | S | A   | Т | Y | 13    |
| 79    | 23   | E | E | A | 0  | F | W | L   | A | F | 13    |
| 80    | 28   | W | L | A | F  | P | L | С   | S | L | 13    |
| 81    | 44   | N | L | Т | I  | I | Y | I   | v | R | 13    |
| 82    | 51   | V | R | Т | E  | Н | s | L   | Н | E | 13    |
| 83    | 56   | s | L | Н | E  | P | М | Y   | I | F | 13    |
| 84    | 60   | P | м | Y | I  | F | L | C   | М | L | 13    |
| 85    | 72   | D | I | L | I  | s | Т | s   | S | м | 13    |
| 86    | 74   | L | I | s | Т  | s | s | М   | P | K | 13    |
| 87    | 75   | I | s | Т | s  | s | М | P   | K | М | 13    |
| 88    | 98   | A | C | L | L  | 0 | I | F   | A | I | 13    |
| 89    | 104  | F | A | I | Н  | s | L | s   | G | м | 13    |
| 90    | 110  | s | G | М | E  | s | Т | v   | L | L | 13    |
| 91    | 116  | v | L | L | A  | М | Ā | F   | D | R | 13    |
| 92    | 126  | v | A | I | C  | Н | P | L   | R | н | 13    |
| 93    | 149  | A | A | v | v  | R | G | A   | A | L | 13    |
| 94    | 158  | М | A | P | L  | P | v | F   | I | ĸ | 13    |
| 95    | 164  | F | I | K | Q  | L | P | F   | C | R | 13    |
| 96    | 170  | F | c | R | S  | N | I | L   | s | н | 13    |
| 97    | 171  | C | R | s | N  | I | L | s   | Н | s | 13    |
| 98    | 187  | М | ĸ | L | A  | C | D | D   | I | R | 13    |
| 99    | 217  | s | F | s | Y  | L | L | I   | L | ĸ | 13    |
| 100   | 224  | L | ĸ | T | v  | L | G | L   | Т | R | 13    |
| 101   | 242  | С | v | s | Н  | v | С | A   | v | F | 13    |
| _ ~ _ | - 12 |   | • | , | •• | • | _ | . 1 | • | - | 72    |
|       |      |   |   |   |    |   |   |     |   |   | 12    |

HLA-B\*2705 nonomers (SEQ ID NOS 1891-2008, respectively in order of appearance)

|     | Pos | _            | _ | _ |   | _            | _ | _ | _ | _ | score |
|-----|-----|--------------|---|---|---|--------------|---|---|---|---|-------|
|     |     | 1            | 2 | 3 | 4 | 5            | 6 | 7 | 8 | 9 |       |
| 102 | 256 | F            | I | G | L | S            | М | V | Н | R | 13    |
| 103 | 261 | М            | V | Н | R | F            | s | K | R | R | 13    |
| 104 | 49  | Y            | I | V | R | Т            | E | Н | S | L | 12    |
| 105 | 57  | L            | Н | E | P | M            | Y | Ι | F | L | 12    |
| 106 | 88  | W            | F | N | S | Т            | Т | Ι | Q | F | 12    |
| 107 | 96  | F            | D | Α | C | L            | L | Q | I | F | 12    |
| 108 | 134 | Н            | A | Т | V | L            | T | L | P | R | 12    |
| 109 | 152 | V            | R | G | Α | Α            | L | М | A | P | 12    |
| 110 | 179 | S            | Y | С | L | Н            | Q | D | V | M | 12    |
| 111 | 197 | N            | v | V | Y | G            | L | 1 | V | 1 | 12    |
| 112 | 244 | s            | H | V | C | Α            | V | F | Ι | F | 12    |
| 113 | 265 | F            | s | K | R | R            | D | s | P | L | 12    |
| 114 | 273 | $\mathbf{L}$ | P | V | Ι | $\mathbf{L}$ | Α | N | Ι | Y | 12    |
| 115 | 285 | P            | P | V | L | N            | P | Ι | V | Y | 12    |
| 116 | 288 | L            | N | P | Ι | v            | Y | G | V | ĸ | 12    |
| 117 | 296 | K            | T | K | E | I            | R | Q | R | I | 12    |
| 118 | 297 | T            | ĸ | E | Ι | R            | Q | R | Ι | L | 12    |

# HLA-B\*2709 nonomers(SEQ ID NOS 2009-2063, respectively in order of appearance)

|    | Pos | 1            | 2            | 3 | 4 | 5 | 6 | 7 | 8 | 9 | score |
|----|-----|--------------|--------------|---|---|---|---|---|---|---|-------|
| 1  | 194 | I            | R            | v | N |   | v | Y | G | L | 24    |
| 2  | 268 | R            | R            | D | s | P | L | P | v | I | 24    |
| 3  | 132 | L            | R            | Н | Α | Т | V | L | Т | L | 22    |
| 4  | 267 | K            | R            | R | D | s | P | L | Р | V | 21    |
| 5  | 300 | I            | R            | Q | R | Ι | L | R | L | F | 20    |
| 6  | 231 | $\mathbf{T}$ | R            | E | Α | Q | Α | K | Α | F | 19    |
| 7  | 302 | Q            | R            | I | L | R | L | F | Н | V | 19    |
| 8  | 124 | R            | Y            | V | A | Ι | С | Н | P | L | 16    |
| 9  | 269 | R            | D            | s | P | L | P | V | I | L | 16    |
| 10 | 43  | G            | N            | L | T | I | I | Y | I | V | 15    |
| 11 | 216 | I            | S            | F | S | Y | L | L | Ι | L | 1.5   |
| 12 | 11  | Α            | T            | Y | F | Ι | L | Ι | G | L | 14    |
| 13 | 25  | Α            | Q            | F | W | L | Α | F | P | L | 14    |
| 14 | 153 | R            | G            | A | Α | L | М | A | P | L | 14    |
| 15 | 174 | N            | Ι            | L | S | Н | S | Y | C | L | 14    |
| 16 | 222 | L            | I            | L | K | T | V | L | G | L | 14    |
| 17 | 257 | I            | G            | L | s | M | V | Н | R | F | 14    |
| 18 | 280 | Ι            | Y            | L | L | V | P | P | V | L | 14    |
| 19 | 6   | G            | N            | Е | S | S | А | Т | Y | F | 13    |
| 20 | 14  | F            | Ι            | L | I | G | L | P | G | Ļ | 13    |
| 21 | 21  | G            | L            | Ė | E | A | Q | F | W | L | 13    |
| 22 | 66  | С            | М            | L | s | G | I | D | I | L | 13    |
| 23 | 130 | H            | P            | L | R | H | A | Т | V | L | 13    |
| 24 | 201 | G            | $\mathbf{L}$ | Ι | V | Ι | Ι | S | Α | I | 13    |
| 25 | 203 | I            | V            | I | Ι | s | A | I | G | L | 13    |
|    |     |              |              |   |   |   |   |   |   |   | 73    |

HLA-B\*2709 nonomers(SEQ ID NOS 2009-2063, respectively in order of appearance)

|     | Pos | 1 | 2            | 3 | 4 | 5 | 6 | 7 | 8 | 9        | score |
|-----|-----|---|--------------|---|---|---|---|---|---|----------|-------|
| 26  | 214 | L | L            | I | s | F | s | Y | L | L        | 13    |
| 27  | 251 | I | F            | Y | v | P | F | I | G | L        | 13    |
| 28  | 263 | Н | R            | F | s | K | R | R | D | s        | 13    |
| 29  | 275 | V | I            | L | Α | N | Ι | Y | L | L        | 13    |
| 30  | 305 | L | R            | L | F | Н | v | Α | T | Н        | 13    |
| 31  | 30  | Α | F            | P | L | С | S | L | Y | L        | 12    |
| 32  | 34  | C | S            | L | Y | L | I | A | V | L        | 12    |
| 33  | 37  | Y | L            | Ι | Α | ٧ | L | G | N | L        | 12    |
| 34  | 51  | V | R            | T | E | Н | S | L | Н | E        | 12    |
| 35  | 60  | P | M            | Y | I | F | L | C | M | L        | 12    |
| 36  | 75  | I | S            | T | S | S | М | P | K | M        | 12    |
| 37  | 93  | Т | Ι            | Q | F | D | A | С | L | L        | 12    |
| 38  | 123 | D | R            | Y | V | А | I | С | Н | Р        | 12    |
| 39  | 135 | A | T            | V | L | T | L | P | R | V        | 12    |
| 40  | 138 | L | T            | L | P | R | V | T | K | I        | 12    |
| 41  | 149 | Α | Α            | V | V | R | G | A | Α | L        | 12    |
| 42  | 155 | Α | Α            | L | М | A | P | L | P | V        | 12    |
| 43  | 168 | L | Ρ            | F | С | R | S | N | I | L        | 12    |
| 44  | 181 | C | L            | Н | Q | D | V | М | K | L        | 12    |
| 45  | 188 | K | L            | A | С | D | D | Ι | R | V        | 12    |
| 46  | 190 | Α | С            | D | D | I | R | V | N | V        | 12    |
| 47  | 195 | R | V            | N | V | V | Y | G | L | I        | 12    |
| 48  | 210 | G | ŗ            | D | s | L | L | I | S | F        | 12    |
| 49  | 213 | s | $\mathbf{L}$ | L | Ι | s | F | S | Y | L        | 12    |
| 50  | 220 | Y | L            | L | Ι | L | K | T | V | $\Gamma$ | 12    |
| 51  | 248 | Α | V            | F | I | F | Y | V | P | F        | 12    |
| 52  | 279 | N | Ι            | Y | L | L | V | P | P | V        | 12    |
| 53  | 287 | V | L            | N | P | Ι | V | Y | G | V        | 12    |
| 5,4 | 296 | K | Т            | K | E | Ι | R | Q | R | I        | 12    |
| 55  | 299 | E | Ι            | R | Q | R | Ι | L | R | L        | 12    |

# HLA-B\*5101 nonomers (SEQ ID NOS 2064-2132, respectively in order of appearance)

|    | Pos | 1 | 2 | 3 | 4            | 5            | 6 | 7 | 8 | 9 | score |
|----|-----|---|---|---|--------------|--------------|---|---|---|---|-------|
| 1  | 39  | I | A | v | L            | G            | N | L | Т | I | 26    |
| 2  | 31  | F | P | L | С            | s            | L | Y | L | I | 25    |
| 3  | 120 | M | A | F | D            | R            | Y | V | A | I | 24    |
| 4  | 130 | Н | P | L | R            | Н            | Α | Т | V | L | 23    |
| 5  | 118 | L | A | M | Α            | F            | D | R | Y | v | 22    |
| 6  | 140 | L | P | R | V            | $\mathbf{T}$ | K | Ι | G | v | 22    |
| 7  | 155 | Α | A | L | M            | Α            | P | L | Р | v | 22    |
| 8  | 42  | L | G | N | $\mathbf{L}$ | T            | 1 | I | Y | I | 21    |
| 9  | 254 | V | P | F | I            | G            | L | S | М | v | 21    |
| 10 | 284 | V | P | P | V            | L            | N | P | I | v | 21    |
| 11 | 168 | L | P | F | C            | R            | s | N | I | L | 20    |
| 12 | 235 | Q | A | K | Α            | F            | G | Т | С | v | 20    |
| 13 | 138 | L | T | L | P            | R            | V | Т | K | I | 19    |
|    |     |   |   |   |              |              |   |   |   |   | 74    |

74

HLA-B\*5101 nonomers (SEQ ID NOS 2064-2132, respectively in order of appearance)

| 1  |    |     |   |   |   |              |   |   |   |   |   |       |
|--|----|-----|---|---|---|--------------|---|---|---|---|---|-------|
| 14   |    | Pos | 1 | 2 | 3 | 4            | 5 | 6 | 7 | 8 | 9 | score |
| 15   | 14 | 159 |   |   |   |              |   |   |   |   |   | 18    |
| 16   |    |     |   |   |   |              |   |   |   |   |   |       |
| 17   |    |     |   |   |   |              |   |   |   |   |   |       |
| 18   |    |     |   |   |   |              |   |   |   |   |   |       |
| 19   |    |     |   |   |   |              |   |   |   |   |   |       |
| 20 63  |    |     |   |   |   |              |   |   |   |   |   |       |
| 21       86       I F W F N S T T I       16         22       110       S G M E S T V L L       16         23       144       T K I G V A A V V       16         24       149       A A V V R G A A L       16         25       197       N V V Y G L I V I       16         25       197       N V V Y G L I V I       16         26       271       S P L P V I L A N       16         27       280       I Y L L V P P V L       16         28       3 D P N G N E S S A       15         29       40 A V L G N L T I I       15         30       97 D A C L L Q I F A       15         31       132 L R H A T V L T L T L       15         32       222 L I L K T V L V P P V       15         33       279 N I Y L L V P P V       15         34       285 P P V L N P I V Y G V K T       15         35       289 N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65 L C M L S G I D I       14         43       84 L A I F W F N S T       14         44       158 M A P L P V F I K       14         44       158 M A P L P V F I G L  |    |     |   |   |   |              |   |   |   |   |   |       |
| 22       110       S G M E S T V L L       16         23       144       T K I G V A A V V       16         24       149       A A V V R G A A L       16         25       197       N V V Y G L I V I       16         25       197       N V V Y G L I V I       16         26       271       S P L P V I L A N       16         27       280       I Y L L V P P V L       16         28       3 D P N G N E S S A       15         29       40 A V L G N L T I I       15         30       97 D A C L L Q I F A       15         31       132 L R H A T V L T L I       15         32       222 L I L K T V L V P P V       15         31       132 L R H A T V L V Y G V K T       15         34       285 P P V L L N P I V Y G V K T       15         35       289 N P I V L N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65 L C M L S G I D I       14         438       84 L A I F W F N S T       14         44       158 M A P L P V F I K       14         40       157 L M A P L P V F I K       14         41       158 M A P L P V F I K </td <td></td>   |    |     |   |   |   |              |   |   |   |   |   |       |
| 23   |    |     |   |   |   |              |   |   |   |   |   |       |
| 24       149       A A V V R G A A L       16         25       197       N V V R G L I V I       16         26       271       S P L P V I L A N       16         27       280       I Y L L V P P V L       16         28       3 D P N G N E S S A       15         29       40 A V L G N L T I I       15         30       97 D A C L L Q I F A       15         31       132 L R H A T V L T L       15         32       222 L I L K T V L G L       15         33       279 N I Y L L V P P V       15         34       285 P P V L N P I V Y G V K T       15         35       289 N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65 L C M L S G I D I       14         38       84 L A I F W F N S T       14         40       157 L M A P L P V F I K       14         40       157 L M A P L P V F I K       14         41       158 M A P L P V F I K       14         42       191 C D D I R V N V V       14         44       209 I G L D S L L I S A       14         45       215 L I S F S Y L L I L K T V L       14         46   |    |     |   |   |   |              |   |   |   |   |   |       |
| 25   |    |     |   |   |   |              |   |   |   |   | - |       |
| 26       271       S P L P V I L A N       16         27       280       I Y L L V P P V L       16         28       3 D P N G N E S S A       15         29       40 A V L G N L T I I       15         30       97 D A C L L Q I F A       15         31       132 L R H A T V L T L       15         32       222 L I L K T V L G L       15         33       279 N I Y L L V P P V       15         34       285 P P V L N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65 L C M L S G I D I       14         38       84 L A I F W F N S T       14         39       126 V A I C H P L R H       14         40       157 L M A P L P V F I K       14         41       158 M A P L P V F I K       14         42       191 C D D I R V N V V       14         42       191 C D D I R V N V V       14         44       209 I G L D S L L I S A       14         45       215 L I S F S Y L L I       14         46       219 S Y L L I L K T V L       14         47       220 Y L L I L K T V L       14         48       237 K A F G T C V S H   |    |     |   |   |   |              |   |   |   |   |   |       |
| 27       280       I Y L L V P P V L       16         28       3 D P N G N E S S A       15         29       40       A V L G N L T I I       15         30       97       D A C L L Q I F A       15         31       132       L R H A T V L T L       15         32       222       L I L K T V L G L       15         33       279       N I Y L L V P P V       15         34       285       P P V L N P I V Y       15         35       289       N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65       L C M L S G I D I       14         38       84       L A I F W F N S T       14         40       157       L M A P L P V F I K       14         40       157       L M A P L P V F I K       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S I L       14         45       215       L I S F S Y L L I       14         46   |    |     |   |   |   |              |   |   |   |   | Ι | 16    |
| 28       3       D P N G N E S S A       15         29       40       A V L G N L T I I I       15         30       97       D A C L L Q I F A       15         31       132       L R H A T V L T L       15         32       222       L I L K T V L G L       15         33       279       N I Y L L V P P V       15         34       285       P P V L N P I V Y       15         35       289       N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65       L C M L S G I D I       14         38       84       L A I F W F N S T       14         40       157       L M A P L P V F I K       14         40       157       L M A P L P V F I K       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y L L I L K T V L       14         <  | 26 | 271 | S | P | L | Р            | V | Ι | L | A | N | 16    |
| 29   | 27 | 280 | I | Y | L | L            | V | Р | Р | V | L | 16    |
| 30 97 DACLLQIFA  15  31 132 LRHATVLTL  15  32 222 LILKTVLGL  15  33 279 NIYLLVPPV  15  34 285 PPVLNPIVY  15  35 289 NPIVYGVKT  15  36 9 SSATYFILI  14  37 65 LCMLSGIDI  38 84 LAIFWFNST  14  39 126 VAICHPLRH  40 157 LMAPLPVFIK  41 158 MAPLPVFIK  42 191 CDDIRVNVV  43 200 YGLIVIISA  44 209 IGLDSLLIS  44 209 IGLDSLLIS  44 209 IGLDSLLIS  45 215 LISFSYLLI  46 219 SYLLILKTVL  47 220 YLLILKTVL  48 237 KAFGTCVSH  49 247 CAVFIFYVP  14  50 249 VFIFYVPFIGL  51 251 IFYVPFIGL  52 257 IGLSMVHRF  53 268 RRDSPLPVI  54 273 LPVILANIY  55 29 LAFPLCSLY  56 33 LCSLYLIAV  57 55 HSLHEPMYI  58 67 MLSGIDILI  59 80 MPKMLAIFW  13 66 95 QFDACLLQI  13 66 98 ACLLQIFAI  13 66 98 ACLLQIFAI  15 15 13 13 66 10 1 1 1 1 13 13 16 1 18 13 16 1 18 13 16 1 18 15 13 14 14 15 15 11 14 14 15 15 11 14 14 15 15 11 11 11 11 11 11 11 11 11 11 11   | 28 | 3   | D | P | N | G            | N | E | S | S | A | 15    |
| 31       132       L R H A T V L T L       15         32       222       L I L K T V L G L       15         33       279       N I Y L L V P P V       15         34       285       P P V L N P I V Y G V K T       15         35       289       N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65       L C M L S G I D I       14         38       84       L A I F W F N S T       14         39       126       V A I C H P L R H       14         40       157       L M A P L P V F I K       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y L L I L K T V L       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I G L       14  | 29 | 40  | Α | v | L | G            | N | L | T | Ι | I | 15    |
| 32 222 LILKTVLGL 15 33 279 NIYLLVPPV 15 34 285 PPVLNPIVY 15 35 289 NPIVYGVKT 15 36 9 SSATYFILL 1 14 37 65 LCMLSGIDI 14 38 84 LAIFWFNST 14 40 157 LMAPLPVFI 14 41 158 MAPLPVFI 14 42 191 CDDIRVVVV 14 43 200 YGLIVIISA 14 44 209 IGLDSLLIS 14 45 215 LISFSYLLI 14 46 219 SYLLILKTV 14 47 220 YLLILKTV 14 48 237 KAFGTCVSH 14 49 247 CAVFIFYV PFI 14 50 249 VFIFYV PFI 14 51 251 IFYV PFI 14 52 257 IGLSMV HRF 14 53 268 RRDSPLPVI 14 54 273 LPVI LANIY 14 55 29 LAFPLCSLY 13 56 33 LCSLYLIAV 13 57 55 HSLHEPMY 13 58 67 MLSGIDILT 13 60 95 QFDACLLQIFAI   | 30 | 97  | D | A | С | L            | L | Q | I | F | A | 15    |
| 33 279 N I Y L L V P P V 15 34 285 P P V L N P I V Y 15 35 289 N P I V Y G V K T 15 36 9 S S A T Y F I L I 14 37 65 L C M L S G I D I 14 38 84 L A I F W F N S T 14 40 157 L M A P L P V F I K 14 41 158 M A P L P V F I K 14 42 191 C D D I R V N V V 14 43 200 Y G L I V I I S A 14 44 209 I G L D S L L I S 14 45 215 L I S F S Y L L I 14 46 219 S Y L L I L K T V 14 47 220 Y L L I L K T V 14 48 237 K A F G T C V S H 14 49 247 C A V F I F Y V P F I 14 50 249 V F I F Y V P F I G L 14 51 251 I F Y V P F I G L 14 52 257 I G L S M V H R F 14 53 268 R R D S P L P V I 14 54 273 L P V I L A N I Y 14 55 29 L A F P L C S L Y 13 56 33 L C S L Y L I A V 13 57 55 H S L H E P M Y I 13 58 67 M L S G I D I L I 13 59 80 M P K M L A I F W 13 60 95 Q F D A C L L Q I 13 61 98 A C L L Q I F A I 13 62 104 F A I H S L S G M 13   | 31 | 132 | L | R | Н | A            | Т | V | L | T | L | 15    |
| 34       285       P P V L N P I V Y       15         35       289       N P I V Y G V K T       15         36       9       S S A T Y F I L I       14         37       65       L C M L S G I D I       14         38       84       L A I F W F N S T       14         39       126       V A I C H P L R H       14         40       157       L M A P L P V F I K       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y L L I L K T V L       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14  | 32 | 222 | L | I | L | K            | Т | V | L | G | L | 15    |
| 35       289       N P I V Y G V K T       15         36       9 S S A T Y F I L I       14         37       65 L C M L S G I D I       14         38       84 L A I F W F N S T       14         39       126 V A I C H P L R H       14         40       157 L M A P L P V F I K       14         41       158 M A P L P V F I K       14         42       191 C D D I R V N V V       14         43       200 Y G L I V I I S A       14         44       209 I G L D S L L I S       14         45       215 L I S F S Y L L I       14         46       219 S Y L L I L K T V       14         47       220 Y L L I L K T V L       14         48       237 K A F G T C V S H       14         49       247 C A V F I F Y V P F I       14         50       249 V F I F Y V P F I G L       14         51       251 I F Y V P F I G L       14         52       257 I G L S M V H R F       14         53       268 R R D S P L P V I       14         54       273 L P V I L A N I Y       14         55       29 L A F P L C S L Y       13         56       33 L C S L Y L I A V       13  | 33 | 279 | И | I | Y | L            | L | V | P | P | v | 15    |
| 36       9       S       S       A       T       Y       F       I       L       I       14         37       65       L       C       M       L       S       G       I       D       I       14         38       84       L       A       I       F       W       F       N       S       T       14         39       126       V       A       I       C       H       P       L       R       H       14         40       157       L       M       A       P       L       P       V       F       I       14         41       158       M       A       P       L       P       V       F       I       K       14         42       191       C       D       D       I       R       N       V       V       14         43       200       Y       G       L       I       I       14       14         45       215       L       I       S       F       S       Y       L       I       14         47       220       Y       L  | 34 | 285 | P | P | V | $\mathbf{L}$ | N | Ρ | I | V | Y | 15    |
| 37 65 L C M L S G I D I 14 38 84 L A I F W F N S T 14 39 126 V A I C H P L R H 14 40 157 L M A P L P V F I 14 41 158 M A P L P V F I K 14 42 191 C D D I R V N V V 14 43 200 Y G L I V I I S A 14 44 209 I G L D S L L I S 14 45 215 L I S F S Y L L I 14 46 219 S Y L L I L K T V 14 47 220 Y L L I L K T V L 14 48 237 K A F G T C V S H 14 49 247 C A V F I F Y V P F I 14 50 249 V F I F Y V P F I 14 51 251 I F Y V P F I G L 14 52 257 I G L S M V H R F 14 53 268 R R D S P L P V I 14 54 273 L P V I L A N I Y 14 55 29 L A F P L C S L Y 13 56 33 L C S L Y L I A V 13 57 55 H S L H E P M Y I 13 58 67 M L S G I D I L I 13 59 80 M P K M L A I F W 13 60 95 Q F D A C L L Q I 13 61 98 A C L L Q I F A I 13 62 104 F A I H S L S G M 13   | 35 | 289 | N | P | Ι | V            | Y | G | V | K | T | 15    |
| 38       84       L A I F W F N S T       14         39       126       V A I C H P L R H       14         40       157       L M A P L P V F I K       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y I L I I L K T V L       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13   | 36 | 9   | S | S | Α | Т            | Y | F | I | L | I | 14    |
| 39       126       V A I C H P L R H       14         40       157       L M A P L P V F I       14         41       158       M A P L P V F I K       14         42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y I L I I L K T V L       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13   | 37 | 65  | L | C | М | L            | S | G | I | D | I | 14    |
| 40 157 LMAPLPVFI 41 158 MAPLPVFIK 42 191 CDDIRVVV 14 43 200 YGLIVIISA 44 209 IGLDSLLIS 45 215 LISFSYLLI 46 219 SYLLILKTV 47 220 YLLILKTV 48 237 KAFGTCVSH 49 247 CAVFIFYV 50 249 VFIFYVP 51 EXTRA 51 EXTRA 52 257 IGLSMVHRF 53 268 RRDSPLPVI 54 273 LPVILANIY 55 29 LAFPLCSLY 56 33 LCSLYLIANIY 57 55 HSLHEPMYI 58 67 MLSGIDILI 59 80 MPKMLAIFW 60 95 QFDACLLQI 61 98 ACLLQIFAI 61 98 ACLLQIFAI 61 98 ACLLLQIFAI 61 98 ACLLLQI | 38 | 84  | L | A | Ι | F            | W | F | N | S | T | 14    |
| 41 158 MAPLPVFIK 14 42 191 CDDIRVVV 14 43 200 YGLIVIISA 14 44 209 IGLDSLLIS 14 45 215 LISFSYLLI 14 46 219 SYLLILKTV 14 47 220 YLLILKTV 14 48 237 KAFGTCVSH 14 49 247 CAVFIFYV P 14 50 249 VFIFYV P 14 51 251 IFYV PFI GL 14 52 257 IGLSMVHRF 14 53 268 RRDSPLPVI 14 54 273 LPVILANIY 14 55 29 LAFPLCSLY 13 56 33 LCSLYLIANIY 14 55 29 LAFPLCSLY 13 56 33 LCSLYLIANIY 14 57 55 HSLHEPMYI 13 58 67 MLSGIDILI 15 59 80 MPKMLAIFW 13 60 95 QFDACLLQI 13 61 98 ACLLQIFAI 13   | 39 | 126 | V | A | I | С            | Н | P | L | R | Н | 14    |
| 42       191       C D D I R V N V V       14         43       200       Y G L I V I I S A       14         44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y L L I L K T V       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13  |    | 157 | L | M | A | P            | L | P | V | F | I | 14    |
| 43 200 Y G L I V I I S A 14  44 209 I G L D S L L I S 14  45 215 L I S F S Y L L I 14  46 219 S Y L L I L K T V 14  47 220 Y L L I L K T V 14  48 237 K A F G T C V S H 14  49 247 C A V F I F Y V P F I 14  50 249 V F I F Y V P F I G L 14  51 251 I F Y V P F I G L 14  52 257 I G L S M V H R F 14  53 268 R R D S P L P V I 14  54 273 L P V I L A N I Y 14  55 29 L A F P L C S L Y 13  56 33 L C S L Y L I A V 13  57 55 H S L H E P M Y I 13  58 67 M L S G I D I L I 13  59 80 M P K M L A I F W 13  60 95 Q F D A C L L Q I 13  61 98 A C L L Q I F A I 13  62 104 F A I H S L S G M 13  | 41 | 158 | M | A | P | L            | P | V | F | I | K | 14    |
| 44       209       I G L D S L L I S       14         45       215       L I S F S Y L L I       14         46       219       S Y L L I L K T V       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13   | 42 | 191 | C | D | D | Ι            | R | V | N | V | v | 14    |
| 45 215 L I S F S Y L L I 14 46 219 S Y L L I L K T V 14 47 220 Y L L I L K T V L 14 48 237 K A F G T C V S H 14 49 247 C A V F I F Y V P 14 50 249 V F I F Y V P F I G L 14 51 251 I F Y V P F I G L 14 52 257 I G L S M V H R F 14 53 268 R R D S P L P V I 14 54 273 L P V I L A N I Y 14 55 29 L A F P L C S L Y 13 56 33 L C S L Y L I A V 13 57 55 H S L H E P M Y I 13 58 67 M L S G I D I L I 13 59 80 M P K M L A I F W 13 60 95 Q F D A C L L Q I 13 61 98 A C L L Q I F A I 13   | 43 | 200 | Y | G | L | Ι            | V | Ι | I | S | A | 14    |
| 46       219       S Y L L I L K T V       14         47       220       Y L L I L K T V L       14         48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    | 209 | Ι | G | L | D            | S | L | L | Ι | s | 14    |
| 47 220 Y L L I L K T V L 14  48 237 K A F G T C V S H 14  49 247 C A V F I F Y V P 14  50 249 V F I F Y V P F I 14  51 251 I F Y V P F I G L 14  52 257 I G L S M V H R F 14  53 268 R R D S P L P V I 14  54 273 L P V I L A N I Y 14  55 29 L A F P L C S L Y 13  56 33 L C S L Y L I A V 13  57 55 H S L H E P M Y I 13  58 67 M L S G I D I L I 13  59 80 M P K M L A I F W 13  60 95 Q F D A C L L Q I 13  61 98 A C L L Q I F A I 13  62 104 F A I H S L S G M 13  |    | 215 |   |   |   | F            | S | Y | L |   | I | 14    |
| 48       237       K A F G T C V S H       14         49       247       C A V F I F Y V P F I       14         50       249       V F I F Y V P F I G L       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     | s |   |   | L            | Ι | L |   | Т | V | 14    |
| 49       247       C A V F I F Y V P       14         50       249       V F I F Y V P F I       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     |   |   |   | Ι            | L |   | Т |   | L | 14    |
| 50       249       V F I F Y V P F I       14         51       251       I F Y V P F I G L       14         52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     |   |   |   | G            | Т | С | V |   | Н | 14    |
| 51       251       I       F       Y       V       P       F       I       G       L       14         52       257       I       G       L       S       M       V       H       R       F       14         53       268       R       R       D       S       P       L       P       V       I       14         54       273       L       P       V       I       L       N       I       Y       14         55       29       L       A       F       P       L       C       S       L       Y       13         56       33       L       C       S       L       Y       L       A       Y       I       13         57       55       H       S       L       H       E       P       M       Y       I       13         58       67       M       L       S       G       I       D       I       L       I       13         60       95       Q       F       D       A       C       L       L       Q       I       I       13 </td <td></td> <td>247</td> <td></td> <td>Α</td> <td></td> <td>F</td> <td>Ι</td> <td>F</td> <td>Y</td> <td>V</td> <td>P</td> <td>14</td>  |    | 247 |   | Α |   | F            | Ι | F | Y | V | P | 14    |
| 52       257       I G L S M V H R F       14         53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     | V | F |   |              |   | V | P | F | Ι | 14    |
| 53       268       R R D S P L P V I       14         54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     |   |   |   |              |   |   |   |   |   |       |
| 54       273       L P V I L A N I Y       14         55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   | 52 | 257 | Ι | G | L | S            | M |   | H | R | F | 14    |
| 55       29       L A F P L C S L Y       13         56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     |   |   |   |              |   |   |   |   |   |       |
| 56       33       L C S L Y L I A V       13         57       55       H S L H E P M Y I       13         58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13  |    |     |   |   |   |              |   |   |   |   |   |       |
| 57 55 H S L H E P M Y I 13<br>58 67 M L S G I D I L I 13<br>59 80 M P K M L A I F W 13<br>60 95 Q F D A C L L Q I 13<br>61 98 A C L L Q I F A I 13<br>62 104 F A I H S L S G M 13  |    |     |   |   |   | P            | L |   | S |   |   |       |
| 58       67       M L S G I D I L I       13         59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13  |    |     |   |   |   | L            |   |   | 1 |   | V |       |
| 59       80       M P K M L A I F W       13         60       95       Q F D A C L L Q I       13         61       98       A C L L Q I F A I       13         62       104       F A I H S L S G M       13   |    |     |   |   |   |              |   |   |   |   |   |       |
| 60 95 Q F D A C L L Q I 13<br>61 98 A C L L Q I F A I 13<br>62 104 F A I H S L S G M 13  |    |     |   |   |   |              |   |   |   |   |   |       |
| 61 98 A C L L Q I F A I 13 62 104 F A I H S L S G M 13   |    |     |   |   |   |              |   |   |   |   |   |       |
| 62 104 F A I H S L S G M 13  |    |     |   |   |   |              |   |   |   |   |   |       |
|  |    |     |   |   |   |              |   |   |   |   |   |       |
| 75   | 62 | 104 | F | A | I | Н            | S | L | S | G | M |       |
|  |    |     |   |   |   |              |   |   |   |   |   | 75    |

## HLA-B\*5101 nonomers (SEQ ID NOS 2064-2132, respectively in order of appearance)

| score |         |   |   |   |    |    |   |   |   | Pos |    |
|-------|---------|---|---|---|----|----|---|---|---|-----|----|
| SCOLE | 9       | 8 | 7 | 6 | 5  | 4  | 3 | 2 | 1 | 105 |    |
| 13    | G       | R | v | V | Α  | Α  | v | G | I | 146 | 63 |
| 13    | A       | Α | G | R | v  | V  | Α | A | V | 148 | 64 |
| 13    | L       | P | Α | M | L  | A  | A | G | R | 153 | 65 |
| 13    | ${f T}$ | G | F | А | K  | Α  | Q | A | E | 233 | 66 |
| 13    | I       | F | V | A | .C | V. | Н | s | v | 243 | 67 |
| . 13  | I       | Ė | K | T | K  | V  | G | Y | V | 292 | 68 |
| 13    | T       | R | 0 | R | Т  | E  | ĸ | т | к | 296 | 69 |

Table XXVII, beginning at page 201, line 1, has been amended as follows:

#### Table XXVII:

#### HLA Class I decamers

| HLA-A1 decamers (SEQ ID NOS | 3 |
|-----------------------------|---|
| 2133-2153, respectively in  | 1 |
| order of appearance)        | _ |

|    | order | OI | ap                       | рe | ar | an | ce           | <u> </u>                             |   |   |   |       |
|----|-------|----|--------------------------|----|----|----|--------------|--------------------------------------|---|---|---|-------|
|    | Pos   | 1  | 2                        | 3  | 4  | 5  | 6            | 7                                    | 8 | 9 | 0 | score |
| 1  | 191   | С  | $\underline{\mathbf{p}}$ | D  | Ι  | R  | ٧            | N                                    | V | v | Y | 27    |
| 2  | 244   | S  | $\underline{\mathbf{H}}$ | v  | C  | Α  | v            | F                                    | Ι | F | Y | 24    |
| 3  | 40    | Α  | V                        | L  | G  | N  | L            | $\underline{\mathbf{T}}$             | I | I | Y | 21    |
| 4  | 284   | V  | $\underline{\mathbf{P}}$ | P  | V  | L  | N            | $\underline{\underline{P}}$          | I | v | Y | 21    |
| 5  | 116   | V  | ഥ                        | L  | Α  | M  | Α            | $\underline{\mathbf{F}}$             | D | R | Y | 20    |
| 6  | 28    | W  | Ŀ                        | A  | F  | P  | $\mathbf{L}$ | $\underline{c}$                      | S | L | Y | 18    |
| 7  | 297   | T  | K                        | E  | Ι  | R  | Q            | $\underline{\mathbf{R}}$             | I | L | R | 17    |
| 8  | 21    | G  | Ē                        | E  | E  | Α  | Q            | $\underline{\mathbf{F}}$             | W | L | Α | 16    |
| 9  | 22    | L  | $\mathbf{E}$             | E  | A  | Q  | F            | M                                    | L | A | F | 16    |
| 10 | 52    | R  | T                        | E  | Н  | S  | L            | $\overline{\mathbf{H}}$              | E | P | M | 16    |
| 11 | 53    | T  | E                        | Н  | S  | L  | Н            | $\underline{\mathbf{E}}$             | P | M | Y | 16    |
| 12 | 57    | L  | $\overline{H}$           | E  | P  | М  | Y            | Ξ                                    | F | L | С | 16    |
| 13 | 111   | G  | M                        | E  | S  | T  | V            | $\underline{\mathbf{r}}$             | L | A | M | 16    |
| 14 | 272   | P  | $\underline{\mathbf{L}}$ | P  | V  | I  | L            | <u>A</u>                             | N | I | Y | 16    |
| 15 | 1     | M  | $\overline{\Lambda}$     | D  | Р  | N  | G            | $\overline{\mathbf{N}}$              | E | s | S | 15    |
| 16 | 4     | P  | $\underline{\mathbf{N}}$ | G  | N  | E  | S            | $\underline{\mathbf{s}}$             | A | T | Y | 15    |
| 17 | 121   | A  | $\underline{\mathbf{F}}$ | D  | R  | Y  | V            | $\underline{\underline{\mathbf{A}}}$ | Ι | С | Н | 15    |
| 18 | 171   | C  | R                        | S  | N  | Ι  | L            | $\underline{s}$                      | Н | s | Y | 15    |
| 19 | 211   | L  | $\underline{\mathtt{D}}$ | S  | L  | Ļ  | I            | S                                    | F | S | Y | 15    |
| 20 | 8     | E  | $\underline{s}$          | S  | Α  | T  | Y            | $\underline{\mathbf{F}}$             | I | L | Ι | 13    |
| 21 | 190   | A  | $\underline{c}$          | D  | D  | I  | R            | $\overline{\Lambda}$                 | N | v | V | 13    |

## HLA-A\*0201 decamers (<u>SEQ ID</u> NOS 2154-2253, respectively

|   | in ord | er | of | a | pp | ea | ra                       | nc | <u>e)</u> |   |              |       |
|---|--------|----|----|---|----|----|--------------------------|----|-----------|---|--------------|-------|
|   | Pos    | 1  | 2  | 3 | 4  | 5  | 6                        | 7  | 8         | 9 | 0            | score |
| 1 | 221    | L  | L  | Ι | L  | K  | $\underline{\mathbf{T}}$ | V  | L         | G | $\mathbf{L}$ | 30    |
| 2 | 100    | L  | L  | Q | I  | F  | A                        | I  | Н         | s | L            | 29    |
| 3 | 282    | L  | L  | V | P  | P  | $\underline{v}$          | L  | N         | P | Ι            | 27    |
| 4 | 205    | 1  | I  | s | Α  | Ι  | $\underline{\mathbf{G}}$ | L  | D         | s | L            | 26    |
| 5 | 213    | S  | L  | L | Ι  | S  | F                        | S  | Y         | L | L            | 25    |

HLA-A\*0201 decamers(<u>SEQ ID</u> NOS 2154-2253, respectively

|    | in ord | er | ο£ | a | pp           | ea | ra     | nc | e) |   |              |       |
|----|--------|----|----|---|--------------|----|--------|----|----|---|--------------|-------|
|    | Pos    | 1  | 2  | 3 | 4            | 5  | 6      | 7  | 8  | 9 | 0            | score |
| 6  | 56     | S  | L  | Н | E            | P  | Μ      | Y  | I  | F | L            | 24    |
| 7  | 62     | Y  | I  | F | $\mathbf{L}$ | С  | M      | L  | S  | G | I            | 24    |
| 8  | 108    | s  | L  | S | G            | М  | E      | s  | Т  | v | L            | 24    |
| 9  | 117    | L  | L  | Α | М            | Α  | F      | D  | R  | Y | v            | 24    |
| 10 | 131    | P  | L  | R | Н            | A  | T      | V  | L  | T | L            | 24    |
| 11 | 137    | V  | L  | Т | L            | P  | R      | V  | Т  | K | I            | 24    |
| 12 | 215    | L  | I  | s | F            | S  | Y      | L  | L  | I | L            | 24    |
| 13 | 38     | L  | I  | A | v            | L  | G      | N  | L  | T | I            | 23    |
| 14 | 41     | V  | L  | G | N            | L  | T      | I  | I  | Y | I            | 23    |
| 15 | 156    | Α  | L  | М | Α            | P  | L      | P  | V  | F | Ι            | 23    |
| 16 | 193    | D  | I  | R | V            | N  | v      | v  | Y  | G | L            | 23    |
| 17 | 214    | L  | L  | I | s            | F  | s      | Y  | L  | L | 1            | 23    |
| 18 | 32     | P  | L  | С | s            | L  | Y      | L  | Ι  | A | v            | 22    |
| 19 | 119    | Α  | М  | Α | F            | D  | R      | Y  | v  | A | I            | 22    |
| 20 | 237    | K  | A  | F | G            | Т  | c      | V  | s  | н | v            | 22    |
| 21 | 275    | V  | I  | L | Α            | N  | I      | Y  | L  | L | v            | 22    |
| 22 | 85     | Α  | I  | F | W            | F  | И      | s  | Т  | T | I            | 21    |
| 23 | 139    | Т  | L  | P | R            | v  | Т      | K  | I  | G | v            | 21    |
| 24 | 202    | L  | I  | v | I            | I  | s      | Α  | Ι  | G | L            | 21    |
| 25 | 13     | Y  | F  | I | L            | I  | G      | L  | P  | G | L            | 20    |
| 26 | 16     | L  | I  | G | L            | P  | G      | L  | Е  | E | Α            | 20    |
| 27 | 29     | L  | A  | F | Р            | L  | C      | s  | L  | Y | L            | 20    |
| 28 | 142    | R  | v  | Т | K            | Ι  | G      | v  | Α  | A | v            | 20    |
| 29 | 148    | V  | A  | Α | v            | v  | R      | G  | Α  | A | L            | 20    |
| 30 | 167    | Q  | L  | Р | F            | С  | R      | s  | N  | I | L            | 20    |
| 31 | 180    | Y  | C  | L | Н            | Q  | D      | v  | М  | ĸ | L            | 20    |
| 32 | 222    | L  | I  | L | K            | T  | v      | L  | G  | L | $\mathbf{T}$ | 20    |
| 33 | 240    | G  | т  | С | v            | s  | H      | v  | С  | A | v            | 20    |
| 34 | 248    | Α  | v  | F | I            | F  | Y      | v  | Р  | F | 1            | 20    |
| 35 | 250    | F  | I  | F | Y            | v  | P      | F  | I  | G | L            | 20    |
| 36 | 271    | s  | P  | L | Р            | v  | I      | L  | Α  | N | I            | 20    |
| 37 | 279    | N  | I  | Y | L            | L  | v      | P  | P  | v | L            | 20    |
| 38 | 304    | I  | L  | R | L            | F  | H      | v  | Α  | T | Н            | 20    |
| 39 | 10     | s  | A  | Т | Y            | F  | I      | L  | 1  | G | L            | 19    |
| 40 | 15     | I  | L  | Ι | G            | L  | P      | G  | L  | E | E            | 19    |
| 41 | 27     | F  | W  | L | Α            | F  | P      | L  | С  | s | L            | 19    |
| 42 | 35     | s  | L  | Y | L            | I  | A      | v  | L  | G | N            | 19    |
| 43 | 37     | Y  | L  | Ι | Α            | v  | L      | G  | N  | L | т            | 19    |
| 44 | 44     | N  | L  | Т | Ι            | Ι  | Y      | I  | V  | R | T            | 19    |
| 45 | 64     | F  | L  | С | М            | L  | s      | G  | Ι  | D | I            | 19    |
| 46 | 83     | М  | L  | Α | I            | F  | W      | F  | N  | s | т            | 19    |
| 47 | 159    | Α  | P  | L | P            | ٧  | F      | I  | K  | Q | L            | 19    |
| 48 | 189    | L  | A  | С | D            | D  | Ī      | R  | V  | N | v            | 19    |
| 49 | 207    | S  | A  | 1 | G            | L  | D      | s  | L  | L | I            | 19    |
| 50 | 253    | Y  | v  | P | F            | I  | G      | L  | s  | М | v            | 19    |
| 51 | 276    | I  | L  | Α | N            | Ι  | _<br>Y | L  | Ļ  | v | P            | 19    |
| 52 | 281    | Y  | L  | L | V            | Р  | P      | v  | L  | N | p            | 19    |
| 53 | 283    | L  | v  | P | P            | v  | L      | N  | P  | I | v            | 19    |
| 54 | 286    | P  | v  | L | N            | P  | I      | V  | Y  | G | v            | 19    |
| 55 | 33     | L  | С  | s | L            | Y  | L      | I  | A  | v | L            | 18    |
|    |        |    |    |   |              |    | _      |    |    |   |              | 77    |
|    |        |    |    |   |              |    |        |    |    |   |              |       |

| HLA-A | *0201  | deca | mers | (SEQ  | ID   |
|-------|--------|------|------|-------|------|
| NOS 2 | 154-22 | 253, | resp | ectiv | rely |

|     |        |   | <u> </u> | 33 |   |    | sp                                   |              | -            | ve | <u>+ x</u> |       |
|-----|--------|---|----------|----|---|----|--------------------------------------|--------------|--------------|----|------------|-------|
|     | in ord |   | of       |    |   |    | ra                                   |              |              |    |            |       |
|     | Pos    | 1 | 2        | 3  | 4 | 5  | 6                                    | 7            | 8            | 9  | 0          | score |
| 56  | 36     | L | Y        | Г  | Ι | A  | v                                    | L            | G            | И  | L          | 18    |
| 57  | 39     | I | A        | V  | L | G  | N                                    | L            | T            | I  | Ι          | 18    |
| 58  | 42     | L | G        | N  | L | Т  | Ī                                    | I            | Y            | I  | V          | 18    |
| 59  | 66     | С | M        | L  | s | G  | Ī                                    | D            | 1            | L  | Ι          | 18    |
| 60  | 111    | G | M        | E  | S | T  | v                                    | L            | L            | A  | M          | 18    |
| 61  | 128    | I | C        | Н  | P | L  | R                                    | H            | Α            | T  | V          | 18    |
| 62  | 134    | Н | A        | T  | V | L  | T                                    | L            | P            | R  | V          | 18    |
| 63  | 154    | G | A        | A  | L | М  | A                                    | P            | L            | P  | V          | 18    |
| 64  | 157    | L | M        | A  | P | .L | P                                    | V            | F            | I  | K          | 18    |
| 65  | 190    | Α | С        | D  | D | Ι  | R                                    | V            | N            | v  | V          | 18    |
| 66  | 229    | G | L        | T  | R | E  | $\underline{\underline{\mathbf{A}}}$ | Q            | Α            | ĸ  | Α          | 18    |
| 67  | 245    | Н | v        | С  | Α | V  | F                                    | I            | F            | Y  | V          | 18    |
| 68  | 274    | P | v        | Ι  | L | Α  | $\overline{\mathbf{N}}$              | I            | Y            | L  | L          | 18    |
| 69  | 278    | Α | N        | Ι  | Y | L  | L                                    | V            | P            | P  | V          | 18    |
| 70  | 291    | I | v        | Y  | G | V  | K                                    | $\mathbf{T}$ | K            | E  | I          | 18    |
| 71  | 298    | K | E        | I  | R | Q  | $\underline{\mathbf{R}}$             | I            | L            | R  | L          | 18    |
| 72  | 48     | I | Y        | I  | V | R  | $\underline{\mathbf{T}}$             | Е            | Н            | s  | L          | 17    |
| 73  | 65     | L | C        | М  | L | S  | $\mathbf{G}$                         | I            | D            | I  | L          | 17    |
| 74  | 67     | M | L        | S  | G | I  | ₽                                    | I            | L            | I  | S          | 17    |
| 75  | 74     | L | I        | S  | Т | S  | <u>s</u>                             | М            | P            | K  | М          | 17    |
| 76  | 91     | s | T        | Т  | I | Q  | F                                    | D            | Α            | C  | L          | 17    |
| 77  | 94     | I | Q        | F  | D | A  | $\underline{C}$                      | L            | $\mathbf{L}$ | Q  | I          | 17    |
| 78  | 188    | K | L        | A  | С | D  | D                                    | I            | R            | v  | N          | 17    |
| 79  | 197    | N | v        | V  | Y | G  | Ŀ                                    | I            | v            | I  | I          | 17    |
| 80  | 200    | Y | G        | L  | I | V  | Ī                                    | I            | S            | A  | I          | 17    |
| 81  | 218    | F | s        | Y  | L | L  | I                                    | L            | K            | T  | V          | 17    |
| 82  | 227    | V | L        | G  | L | Т  | R                                    | E            | A            | Q  | А          | 17    |
| 83  | 303    | R | I        | L  | R | L  | $\underline{\mathbf{F}}$             | Н            | V            | A  | Т          | 17    |
| 84  | 21     | G | L        | E  | E | Α  | Q                                    | F            | W            | L  | A          | 16    |
| 85  | 92     | Т | T        | I  | Q | F  | $\underline{\mathtt{D}}$             | Α            | C            | L  | L          | 16    |
| 86  | 97     | D | A        | С  | L | L  | Q                                    | I            | F            | A  | I          | 16    |
| 87  | 127    | Α | I        | С  | Н | P  | $\underline{\mathbf{L}}$             | R            | Н            | A  | Т          | 16    |
| 88  | 143    | V | T        | K  | 1 | G  | $\underline{\mathtt{v}}$             | Α            | Α            | V  | V          | 16    |
| 89  | 195    | R | v        | N  | V | V  | Y                                    | G            | L            | I  | V          | 16    |
| 90  | 220    | Y | L        | L  | 1 | L  | $\underline{\mathbf{K}}$             | T            | V            | L  | G          | 16    |
| 91  | 296    | K | T        | K  | E | I  | R                                    | Q            | R            | I  | L          | 16    |
| 92  | 18     | G | L        | P  | G | L  | $\mathbf{E}$                         | Е            | A            | Q  | F          | 15    |
| 93  | 30     | Α | F        | P  | L | C  | $\underline{\mathbf{s}}$             | L            | Y            | L  | Ι          | 15    |
| 94  | 126    | V | A        | Ι  | С | Н  | <u>P</u>                             | L            | R            | H  | Α          | 15    |
| 95  | 145    | K | I        | G  | V | Α  | $\underline{\mathbf{A}}$             | V            | V            | R  | G          | 15    |
| 96  | 173    | S | И        | Ι  | L | S  | $\overline{\mathbf{H}}$              | S            | Y            | C  | L          | 15    |
| 97  | 201    | G | L        | I  | V | I  | <u>I</u>                             | s            | A            | I  | G          | 15    |
| 98  | 208    | Α | I        | G  | L | D  | <u>s</u>                             | L            | L            | I  | s          | 15    |
| 99  | 210    | G | L        | D  | s | L  | $\underline{\mathbf{L}}$             | I            | s            | F  | S          | 15    |
| 100 | 267    | K | R        | R  | D | s  | P                                    | L            | P            | v  | I          | 15    |

## HLA-A\*0203 decamers (SEQ ID NOS 2254-2301, respectively

<u>n order of appearance)</u>
Pos 1 2 3 4 5 6 7 8 9 0 score

78

HLA-A\*0203 decamers (SEQ ID NOS 2254-2301, respectively in order of appearance)

| in order of appearance) |            |        |                          |        |        |         |        |                                      |   |        |        |       |
|-------------------------|------------|--------|--------------------------|--------|--------|---------|--------|--------------------------------------|---|--------|--------|-------|
|                         | Pos        | 1      | 2                        | 3      | 4      | 5       | 6      | 7                                    | 8 | 9      | 0      | score |
| 1                       | 141        | P      | R                        | v      | Т      | K       | I      | G                                    | V | A      | Α      | 19    |
| 2                       | 147        | G      | v                        | A      | Α      | V       | V      | R                                    | G | A      | Α      | 19    |
| 3                       | 112        | M      | E                        | S      | Т      | ٧       | L      | $\overline{\mathbf{L}}$              | Α | M      | A      | 18    |
| 4                       | 227        | V      | $\underline{\mathbf{L}}$ | G      | L      | T       | R      | $\underline{\mathbf{E}}$             | A | Q      | Α      | 18    |
| 5                       | 229        | G      | L                        | T      | R      | E       | Α      | Q                                    | Α | ĸ      | A      | 18    |
| 6                       | 142        | R      | v                        | T      | K      | Ι       | G      | $\underline{v}$                      | A | A      | ٧      | 17    |
| 7                       | 148        | V      | A                        | A      | V      | V       | R      | G                                    | A | A      | L      | 17    |
| 8                       | 2          | V      | $\underline{\mathtt{D}}$ | P      | N      | G       | N      | $\underline{\mathbf{E}}$             | S | s      | Α      | 10    |
| 9                       | 16         | L      | I                        | G      | L      | P       | G      | $\underline{\mathbf{r}}$             | E | E      | Α      | 10    |
| 10                      | 21         | G      | $\underline{\mathbf{L}}$ | E      | E      | A       | Q      | $\underline{\mathbf{F}}$             | W | L      | A      | 10    |
| 11                      | 31         | F      | $\underline{\mathbf{P}}$ | L      | C      | S       | L      | $\underline{\underline{\mathbf{Y}}}$ | L | I      | A      | 10    |
| 12                      | 76         | S      | $\underline{\mathbf{T}}$ | S      | S      | M       | P      | K                                    | М | L      | A      | 10    |
| 13                      | 89         | F      | $\overline{\mathbf{N}}$  | s      | T      | T       | Ι      | Q                                    | F | D      | A      | 10    |
| 14                      | 96         | F      | $\overline{\mathbf{D}}$  | A      | C      | L       | L      | $\underline{\underline{Q}}$          | Ι | F      | Α      | 10    |
| 15                      | 110        | s      | $\underline{\mathbf{G}}$ | M      | E      | S       | Т      | $\underline{v}$                      | L | L      | A      | 10    |
| 16                      | 118        | L      | $\underline{\mathbf{A}}$ | M      | Α      | F       | D      | $\underline{\mathbf{R}}$             | Y | V      | A      | 10    |
| 17                      | 126        | V      | <u>A</u>                 | I      | С      | Н       | P      | $\overline{\Gamma}$                  | R | Н      | Α      | 10    |
| 18                      | 140        | L      | $\underline{\mathbf{p}}$ | R      | V      | Т       | K      | $\underline{\mathtt{I}}$             | G | ٧      | A      | 10    |
| 19                      | 146        | I      | $\underline{\mathbf{G}}$ | V      | A      | A       | V      | $\underline{v}$                      | R | G      | A      | 10    |
| 20                      | 150        | A      | $\overline{\Lambda}$     | V      | R      | G       | Α      | <u>A</u>                             | L | M      | A      | 10    |
| 21                      | 181        | C      | $\overline{\mathbf{L}}$  | H      | Q      | D       | V      | M                                    | K | L      | A      | 10    |
| 22                      | 199        | V      | $\overline{X}$           | G      | L      | Ι       | V      | Ī                                    | I | S      | A      | 10    |
| 23                      | 225        | K      | $\underline{\mathbf{T}}$ | V      | L      | G       | L      | $\underline{\underline{\mathbf{T}}}$ | R | E      | A      | 10    |
| 24                      | 239        | F      | $\underline{\mathbf{G}}$ | T      | С      | V       | S      | $\overline{H}$                       | V | С      | A      | 10    |
| 25                      | 269        | R      | $\overline{D}$           | S      | P      | L       | Р      | $\overline{\Lambda}$                 | Ι | L      | A      | 10    |
| 26                      | 302        | Q      | $\underline{R}$          | Ι      | L      | R       | L      | F                                    | Н | v      | A      | 10    |
| 27                      | 305        | L      | $\underline{\mathbf{R}}$ | L      | F      | Н       | V      | <u>A</u>                             | Т | Н      | A      | 10    |
| 28                      | 3          | D      | P                        | N      | G      | N       | Е      | <u>s</u>                             | S | A      | Т      | 9     |
| 29                      | 17         | I      | $\underline{\mathbf{G}}$ | L      | Р      | G       | L      | $\mathbf{E}$                         | E | A      | Q      | 9     |
| 30                      | 22         | L      | $\underline{\mathbf{E}}$ | Ε      | A      | Q       | F      | M                                    | L | Α      | F      | 9     |
| 31                      | 32         | P      | ഥ                        | С      | S      | L       | Y      | <u>L</u>                             | Ι | A      | ٧      | 9     |
| 32                      | 77         | Т      | <u>s</u>                 | S      | M      | P       | K      | M                                    | Ь | A      | I      | 9     |
| 33                      | 90         | N      | <u>s</u>                 | T      | Т      | Ι       | Q      | F                                    | D | A      | C      | 9     |
| 34                      | 97         | D      | A                        | C      | L      | L       | Q      | Ī                                    | F | A      | I      | 9     |
| 35                      | 111        | G      | M                        | E      | S      | Т       | V      | Ē                                    | L | A      | M      | 9     |
| 36                      | 113        | E      | S                        | T      | V      | L       | L      | A                                    | M | A      | F      | 9     |
| 37                      | 119        | A      | M                        | A      | F      | D       | R      | Y                                    | V | A      | I      | 9     |
| 38                      | 127        | A      | Ī                        | C      | Н      | P       | L      | R                                    | Н | A      | Т      | 9     |
| 39                      | 151        | V      | Ā                        | R      | G      | A       | A      | <u>r</u>                             | M | A      | P      | 9     |
| 40                      | 182        | L      | H                        | Q      | D      | V       | M      | K                                    | L | A      | С      | 9     |
| 41                      | 200        | Y      | <u>G</u>                 | L      |        | V       | I      | Ī                                    | S | A      | I      | 9     |
| 42                      | 226        | Т      | V                        | L      | G      | L       | T      | R                                    | E | A      | Q      |       |
| 43                      | 228        | L      | G                        | L      | T      | R       | E      | A                                    | Q | A      | K      | 9     |
| 44                      | 230        | L      | T                        | R      | E      | A<br>S  | Q<br>H | <u>A</u>                             | K | A      | F<br>V | 9     |
| 45<br>46                | 240        | G      | T                        | C      |        |         |        | V                                    | C | A      |        | 9     |
|                         | 270<br>303 | D<br>D | <u>s</u><br>I            | P      | L      | P<br>r. | V      | Ī                                    |   | A      | N      |       |
| 47                      | 303        | R<br>R | L                        | L<br>F | R<br>H | L<br>V  | F<br>A | H<br>T                               | V | A<br>A | T<br>S | 9     |
| 48                      | 300        | ĸ      | 끄                        | £      | п      | ٧       | А      | _                                    | H | ų      | ى      | Э     |

HLA-A26 decamers (SEQ ID NOS 2302-2366, respectively in order of appearance)

| order of appearance) |      |   |              |   |   |   |              |   |   |              |              |          |
|----------------------|------|---|--------------|---|---|---|--------------|---|---|--------------|--------------|----------|
|                      | Pos  | 1 | 2            | 3 | 4 | 5 | 6            | 7 | 8 | 9            | 0            | score    |
| 1                    | 299  | E | Ι            | R | Q | R | I            | L | R | $\mathbf{L}$ | F            | 31       |
| 2                    | 193  | D | Ι            | R | V | N | V            | V | Y | G            | L            | 29       |
| 3                    | 250  | F | I            | F | Y | V | P            | F | I | G            | L            | 25       |
| 4                    | 256  | F | 1            | G | L | s | М            | V | Н | R            | F            | 25       |
| 5                    | 74   | L | I            | s | т | s | s            | М | Р | K            | М            | 24       |
| 6                    | 274  | Р | V            | I | L | А | N            | I | Y | L            | L            | 24       |
| 7                    | 18   | G | L            | P | G | L | Е            | Е | A | Q            | F            | 23       |
| 8                    | 116  | V | L            | L | Ā | М | A            | F | D | R            | Y            | 23       |
| 9                    | 205  | I | I            | s | A | Ι | G            | L | D | s            | L            | 23       |
| 10                   | 221  | L | L            | I | L | K | Т            | v | L | G            | L            | 23       |
| 11                   | 230  | L | Т            | R | E | A | Q            | A | ĸ | Α            | F            | 23       |
| 12                   | 13   | Y | F            | I | L | I | G            | L | P | G            | L            | 22       |
| 13                   | 40   | A | v            | L | G | N | L            | Т | I | I            | Y            | 22       |
| 14                   | 56   | S | L            | Н | E | Р | М            | Y | I | F            |              |          |
|                      |      |   |              |   |   |   |              |   |   |              | L            | 22       |
| 15                   | 95   | Q | F            | D | A | C | L            | L | Q | I            | F            | 22       |
| 16                   | 215  | L | I            | S | F | S | Y            | L | L | I            | L            | 22       |
| 17                   | 92   | Т | T            | Ι | Q | F | D            | Α | С | L            | L            | 21       |
| 18                   | 100  | L | L            | Q | Ι | F | A            | Ι | Н | S            | L            | 21       |
| 19                   | 103  | Ι | F            | A | Ι | Н | S            | L | S | G            | M            | 21       |
| 20                   | 296  | K | Т            | K | Ε | Ι | R            | Q | R | Ι            | L            | 21       |
| 21                   | 28   | W | L            | A | F | Р | L            | С | S | L            | Y            | 20       |
| 22                   | 131  | P | L            | R | Η | А | Т            | V | L | Т            | L            | 20       |
| 23                   | 59   | E | Ρ            | М | Y | Ι | F            | L | C | M            | L            | 19       |
| 24                   | 91   | S | Т            | T | I | Q | F            | D | A | С            | $\mathbf{L}$ | 19       |
| 25                   | 202  | L | Ι            | V | I | 1 | S            | Α | Ι | G            | L            | 19       |
| 26                   | 212  | D | s            | L | L | Ι | S            | F | s | Y            | L            | 19       |
| 27                   | 272  | P | L            | Р | V | Ι | L            | Α | N | I            | Y            | 19       |
| 28                   | 279  | N | I            | Y | L | L | V            | P | Р | V            | L            | 19       |
| 29                   | 52   | R | $\mathbf{T}$ | E | Н | s | L            | Н | E | Р            | М            | 18       |
| 30                   | 62   | Y | Ι            | F | L | С | М            | L | s | G            | Ι            | 18       |
| 31                   | 72   | D | I            | L | Ι | s | $\mathbf{T}$ | s | S | М            | P            | 18       |
| 32                   | 108  | S | L            | s | G | М | E            | s | Т | v            | $\mathbf{L}$ | 18       |
| 33                   | 113  | E | S            | Т | v | L | L            | Α | М | Α            | F            | 18       |
| 34                   | 151  | v | v            | R | G | A | Α            | L | М | Α            | P            | 18       |
| 35                   | 78   | s | S            | M | P | к | М            | L | Α | Ι            | F            | 17       |
| 36                   | 142  | R | v            | Т | K | I | G            | v | Α | Α            | v            | 17       |
| 37                   | 162  | P | v            | F | I | K | 0            | L | P | F            | С            | 17       |
| 38                   | 164  | F | I            | к | Q | L | P            | F | С | R            | s            | 17       |
| 39                   | 167  | Q | L            | P | F | С | R            | s | N | I            | L            | 17       |
| 40                   | 1.85 | D | v            | M | K | L | Α            | C | D | D            | I            | 17       |
| 41                   | 248  | A | v            | F | I | F | Y            | v | P | F            | I            | 17       |
| 42                   | 253  | Y | v            | P | F | I | G            | L | s | М            | v            | 17       |
| 43                   | 45   | L | т            | I | Ī | Ŷ | I            | v | R | Т            | E            | 16       |
| 44                   | 145  | к | I            | G | v | A | A            | v | V | R            | G            | 16       |
|                      |      |   |              |   |   |   |              |   |   |              |              |          |
| 45                   | 198  | V | V            | Y | G | L | I            | V | I | I            | S            | 16<br>16 |
| 46                   | 203  | I | V            | Ι | I | S | A            | I | G | L            | D            | 16       |
| 47                   | 209  | I | G            | L | D | S | L            | L | I | S            | F            | 16       |
| 48                   | 213  | S | L            | L | I | S | F            | S | Y | L            | L            | 16       |
| 49                   | 255  | P | F            | I | G | Г | s            | M | V | H            | R            | 16       |
| 50                   | 264  | R | F            | S | K | R | R            | D | S | P            | L            | 16       |
|                      |      |   |              |   |   |   |              |   |   |              |              | 80       |

## HLA-A26 decamers (SEQ ID NOS 2302-2366, respectively in order of appearance)

|    |     |   |    |   |   |   |   | <u> </u> |   |   |   |       |
|----|-----|---|----|---|---|---|---|----------|---|---|---|-------|
|    | Pos | 1 | 2  | 3 | 4 | 5 | 6 | 7        | 8 | 9 | 0 | score |
| 51 | 294 | G | V  | K | T | K | Ε | I        | R | Q | R | 16    |
| 52 | 16  | L | Ι  | G | L | P | G | L        | E | E | Α | 15    |
| 53 | 80  | M | P  | K | М | L | Α | I        | F | W | F | 15    |
| 54 | 114 | S | Τ, | V | L | L | Α | M        | A | F | D | 15    |
| 55 | 155 | Α | Α  | L | M | A | P | L        | P | V | F | 15    |
| 56 | 159 | A | P  | L | P | V | F | I        | K | Q | L | 15    |
| 57 | 174 | N | I  | L | S | Н | S | Y        | С | L | Н | 15    |
| 58 | 197 | N | V  | V | Y | G | L | I        | V | I | I | 15    |
| 59 | 210 | G | L  | D | S | L | L | I        | S | F | S | 15    |
| 60 | 214 | L | L  | I | s | F | S | Y        | L | L | I | 15    |
| 61 | 222 | L | Ι  | L | K | T | V | L        | G | L | T | 15    |
| 62 | 240 | G | T  | С | V | S | Н | V        | C | Α | V | 15    |
| 63 | 247 | С | A  | V | F | I | F | Y        | V | P | F | 15    |
| 64 | 286 | P | V  | L | N | P | I | V        | Y | G | V | 15    |
| 65 | 298 | ĸ | Е  | I | R | 0 | R | Ι        | L | R | L | 15    |

### HLA-A3 decamers (SEQ ID NOS 2367-2432, respectively in

|    | order | of | аp | рe                                   | ar           | an | ce                          | <u>)</u>                    |   |   | _ |       |
|----|-------|----|----|--------------------------------------|--------------|----|-----------------------------|-----------------------------|---|---|---|-------|
|    | Pos   | 1  | 2  | 3                                    | 4            | 5  | 6                           | 7                           | 8 | 9 | 0 | score |
| 1  | 136   | Т  | v  | Ŀ                                    | $\mathbf{T}$ | L  | P                           | R                           | V | T | K | 31    |
| 2  | 287   | V  | L  | N                                    | Р            | Ι  | $\underline{v}$             | $\underline{\underline{Y}}$ | G | v | K | 28    |
| 3  | 223   | I  | L  | K                                    | T            | V  | $\overline{\mathbf{r}}$     | $\underline{\mathbf{G}}$    | L | T | R | 27    |
| 4  | 304   | I  | L  | $\underline{R}$                      | L            | F  | $\overline{\mathbf{H}}$     | $\overline{\Lambda}$        | A | T | Н | 27    |
| 5  | 73    | I  | L  | I                                    | s            | T  | <u>s</u>                    | <u>s</u>                    | M | P | K | 26    |
| 6  | 15    | I  | L  | I                                    | G            | L  | <u>P</u>                    | $\underline{\mathbf{G}}$    | L | Е | E | 23    |
| 7  | 40    | Α  | v  | $\underline{\mathbf{r}}$             | G            | N  | $\underline{\mathtt{L}}$    | $\underline{{\bf T}}$       | I | I | Y | 23    |
| 8  | 150   | A  | V  | v                                    | R            | G  | <u>A</u>                    | A                           | Ļ | M | A | 23    |
| 9  | 258   | G  | L  | <u>s</u>                             | M            | V  | $\overline{\mathbf{H}}$     | $\underline{\underline{R}}$ | F | S | K | 23    |
| 10 | 18    | G  | L  | $\underline{\underline{\mathbf{P}}}$ | G            | L  | $\underline{\mathbf{E}}$    | $\underline{\mathbf{E}}$    | A | Q | F | 22    |
| 11 | 303   | R  | Ι  | ī                                    | R            | L  | F                           | $\overline{\mathbf{H}}$     | V | A | Т | 22    |
| 12 |       | Ι  | L  | A                                    | N            | I  | $\underline{\mathbf{Y}}$    | $\overline{\Gamma}$         | L | V | P | 21    |
| 13 |       | W  |    | A                                    | F            | Р  | $\overline{\Gamma}$         | $\underline{c}$             | S | L | Y | 20    |
| 14 |       | T  | v  | $\overline{\Gamma}$                  | L            | A  | M                           | <u>A</u>                    | F | D | R | 20    |
| 15 |       | V  | L  | $\overline{\Gamma}$                  | A            | M  | <u>A</u>                    | <u>F</u>                    | D | R | Y | 20    |
| 16 |       | Y  | v  | A                                    | I            | С  | $\underline{\mathbf{H}}$    | $\underline{\mathbf{P}}$    | L | R | Н | 20    |
| 17 |       | P  | L  | R                                    | Н            | A  | $\underline{\underline{T}}$ | $\overline{\Lambda}$        | L | T | L | 20    |
| 18 |       | Т  | K  | Ī                                    | G            | V  | <u>A</u>                    | <u>A</u>                    | V | V | R | 20    |
| 19 |       | Α  | L  | M                                    | A            | P  | Ē                           | $\underline{\mathbf{P}}$    | V | F | Ι | 20    |
| 20 |       | R  | V  | N                                    | V            | V  | $\underline{\mathtt{Y}}$    | $\underline{G}$             | L | Ι | V | 20    |
| 21 |       | S  | L  | $\underline{\underline{\mathbf{Y}}}$ | L            | I  | A                           | <u>v</u>                    | L | G | N | 19    |
| 22 |       | P  | L  | <u>P</u>                             | V            | Ι  | $\overline{\Gamma}$         | <u>A</u>                    | N | I | Y | 19    |
| 23 | 37    | Y  | L  | I                                    | Α            | V  | $\overline{\mathbf{r}}$     | $\underline{\mathbf{G}}$    | N | L | T | 18    |
| 24 |       | Y  | I  | $\underline{v}$                      | R            | T  | E                           | H                           | S | L | Н | 18    |
| 25 |       | I  | v  | $\underline{R}$                      | T            | E  | $\overline{\mathbf{H}}$     | <u>s</u>                    | L | H | Ε | 18    |
| 26 | 108   | S  | L  | $\underline{s}$                      | G            | M  | $\underline{\mathbf{E}}$    | <u>s</u>                    | T | v | L | 18    |
| 27 | 142   | R  | v  | T                                    | K            | Ι  | $\underline{\underline{G}}$ | $\underline{v}$             | A | A | V | 18    |
| 28 |       | K  | L  | $\underline{\underline{\mathbf{A}}}$ | С            | D  | $\underline{\mathtt{D}}$    | <u>I</u>                    | R | v | N | 18    |
| 29 | 279   | N  | I  | $\underline{\underline{Y}}$          | L            | L  | $\overline{\Lambda}$        | <u>P</u>                    | P | v | L | 18    |
| 30 | 291   | I  | v  | $\underline{\underline{Y}}$          | G            | V  | $\underline{\textbf{K}}$    | $\underline{\mathtt{T}}$    | K | E | I | 18    |
|    |       |    |    |                                      |              |    |                             |                             |   |   |   | 81    |

| HLA-A3 decamers (SEQ ID N | OS |
|---------------------------|----|
| 2367-2432, respectively   | in |
| order of appearance)      |    |

|    | <del></del> |   | <u>~⊬</u> | <u> </u>                    |   | WAA. | -                           | <u> </u>                    |   |   |              |       |
|----|-------------|---|-----------|-----------------------------|---|------|-----------------------------|-----------------------------|---|---|--------------|-------|
|    | Pos         | 1 | 2         | 3                           | 4 | 5    | 6                           | 7                           | 8 | 9 | 0            | score |
| 31 | 294         | G | V         | K                           | Т | K    | E                           | Ī                           | R | Q | R            | 18    |
| 32 | 46          | T | I         | I                           | Y | 1    | $\underline{v}$             | R                           | T | E | Н            | 17    |
| 33 | 102         | Q | I         | $\underline{\mathbf{F}}$    | Α | 1    | $\underline{\mathbf{H}}$    | <u>s</u>                    | L | s | G            | 17    |
| 34 | 151         | v | v         | $\underline{\underline{R}}$ | G | A    | A                           | $\overline{\Gamma}$         | М | A | Р            | 17    |
| 35 | 179         | S | Y         | $\overline{C}$              | L | Н    | Q                           | $\underline{\mathtt{D}}$    | V | M | K            | 17    |
| 36 | 203         | I | v         | <u>I</u>                    | I | S    | A                           | I                           | G | L | D            | 17    |
| 37 | 204         | V | I         | Ī                           | Ş | A    | I                           | $\underline{G}$             | L | D | s            | 17    |
| 38 | 220         | Y | L         | $\underline{\mathbf{L}}$    | I | L    | K                           | $\underline{\mathbf{T}}$    | ٧ | L | G            | 17    |
| 39 | 221         | L | L         | <u>I</u>                    | L | K    | $\underline{\mathbf{T}}$    | $\underline{V}$             | L | G | L            | 17    |
| 40 | 227         | V | L         | $\underline{\mathbf{G}}$    | L | T    | $\underline{\mathbf{R}}$    | $\underline{\mathbf{E}}$    | A | Q | Α            | 17    |
| 41 | 242         | C | V         | $\underline{s}$             | Н | V    | <u>C</u>                    | <u>A</u>                    | V | F | I            | 17    |
| 42 | 289         | N | P         | Ī                           | V | Y    | $\underline{\mathbf{G}}$    | $\underline{\underline{v}}$ | K | T | K            | 17    |
| 43 | 38          | L | I         | $\underline{\mathbf{A}}$    | V | L    | $\underline{\mathbf{G}}$    | $\underline{N}$             | L | T | I            | 16    |
| 44 | 85          | A | I         | $\underline{\mathbf{F}}$    | W | F    | N                           | <u>s</u>                    | T | T | Ι            | 16    |
| 45 | 147         | G | v         | <u>A</u>                    | A | V    | $\overline{\Lambda}$        | R                           | G | A | Α            | 16    |
| 46 | 198         | V | V         | $\underline{\underline{Y}}$ | G | L    | I                           | $\underline{\textbf{v}}$    | Ι | I | s            | 16    |
| 47 | 201         | G | L         | $\underline{\mathtt{I}}$    | V | Ι    | Ī                           | $\underline{s}$             | A | I | G            | 16    |
| 48 | 214         | L | L         | Ī                           | S | F    | $\underline{\mathbf{S}}$    | $\underline{\underline{Y}}$ | L | L | I            | 16    |
| 49 | 226         | T | V         | $\overline{\Gamma}$         | G | L    | $\underline{\mathbf{T}}$    | $\underline{\mathbf{R}}$    | E | A | Q            | 16    |
| 50 | 228         | L | G         | $\overline{\mathbf{r}}$     | T | R    | Ē                           | $\underline{\mathtt{A}}$    | Q | A | K            | 16    |
| 51 | 229         | G | L         | $\underline{\mathbf{T}}$    | R | E    | $\underline{\underline{A}}$ | $\underline{\mathtt{Q}}$    | Α | K | А            | 16    |
| 52 | 1           | M | v         | $\underline{\mathtt{D}}$    | Р | N    | $\underline{\mathbf{G}}$    | $\overline{\mathbf{N}}$     | E | S | s            | 15    |
| 53 | 44          | N | L         | $\underline{\mathbf{T}}$    | Ι | Ι    | $\underline{\underline{Y}}$ | Ī                           | V | R | $\mathbf{T}$ | 15    |
| 54 | 47          | I | I         | $\underline{\underline{Y}}$ | Ι | V    | $\underline{\underline{R}}$ | $\underline{\underline{T}}$ | E | H | s            | 15    |
| 55 | 67          | M | L         | <u>s</u>                    | G | I    | $\underline{\underline{D}}$ | Ī                           | L | I | s            | 15    |
| 56 | 72          | D | I         | $\overline{\mathbf{r}}$     | Ι | S    | $\underline{\mathbf{T}}$    | $\underline{s}$             | S | M | P            | 15    |
| 57 | 99          | С | L         | $\overline{\mathbf{r}}$     | Q | I    | F                           | A                           | I | H | S            | 15    |
| 58 | 105         | Α | I         | H                           | S | L    | S                           | $\underline{\mathbf{G}}$    | M | E | s            | 15    |
| 59 | 145         | K | I         | $\underline{G}$             | ٧ | A    | $\underline{\underline{A}}$ | $\underline{\mathtt{v}}$    | V | R | G            | 15    |
| 60 | 175         | I | L         | $\underline{\underline{s}}$ | Η | S    | $\underline{\underline{Y}}$ | $\underline{\mathtt{c}}$    | L | H | Q            | 15    |
| 61 | 191         | С | D         | $\underline{\mathtt{D}}$    | Ι | R    | $\overline{\Lambda}$        | $\overline{\mathbf{N}}$     | V | v | Y            | 15    |
| 62 | 208         | A | I         | $\underline{\mathbf{G}}$    | L | D    | <u>s</u>                    | $\overline{\mathbf{L}}$     | L | I | s            | 15    |
| 63 | 275         | V | I         | $\overline{\Gamma}$         | A | N    | $\underline{\mathtt{I}}$    | $\underline{\underline{Y}}$ | L | L | V            | 15    |
| 64 | 281         | Y | L         | $\overline{\mathbf{r}}$     | V | P    | $\underline{\mathbf{P}}$    | $\underline{\mathtt{v}}$    | L | N | P            | 15    |
| 65 | 299         | E | I         | $\underline{\mathbf{R}}$    | Q | R    | Ī                           | $\underline{\mathbf{r}}$    | R | L | F            | 15    |
| 66 | 306         | R | L         | F                           | Н | V    | A                           | $\underline{\mathbf{T}}$    | Н | A | s            | 15    |

## HLA-B\*0702 decamers (SEQ ID NOS 2433-2492, respectively

|    | in ord | er | of | a | pр | ea | ra | nc | e) |   |              |       |
|----|--------|----|----|---|----|----|----|----|----|---|--------------|-------|
|    | Pos    | 1  | 2  | 3 | 4  | 5  | 6  | 7  | 8  | 9 | 0            | score |
| 1. | 159    | Α  | P  | L | P  | V  | F  | I  | K  | Q | L            | 23    |
| 2  | 59     | E  | P  | M | Y  | I  | F  | L  | С  | M | L            | 22    |
| 3  | 273    | L  | P  | V | I  | L  | Α  | N  | I  | Y | L            | 20    |
| 4  | 3      | D  | P  | N | G  | N  | E  | s  | S  | A | Т            | 19    |
| 5  | 130    | Н  | ₽  | L | R  | Н  | Α  | Т  | V  | L | $\mathbf{T}$ | 19    |
| 6  | 140    | L  | P  | R | V  | T  | K  | Ι  | G  | v | Α            | 19    |
| 7  | 161    | L  | P  | V | F  | I  | K  | Q  | L  | P | F            | 19    |
| 8  | 31     | F  | P  | L | С  | S  | L  | Y  | L  | I | Α            | 18    |
| 9  | 271    | S  | P  | L | P  | V  | Ι  | L  | A  | N | I            | 18    |
|    |        |    |    |   |    |    |    |    |    |   |              | 82    |

HLA-B\*0702 decamers (SEQ ID NOS 2433-2492, respectively

| i  | in ord    | ler | οf | a | pp | ea | ra | nc | e) |   |    |       |
|----|-----------|-----|----|---|----|----|----|----|----|---|----|-------|
| _  | Pos       | 1   | 2  | 3 | 4  | 5  | 6  | 7  | 8  | 9 | 0  | score |
| 10 | 80        | М   | P  | ĸ | М  | L  | Α  | I  | F  | W | F  | 16    |
| 11 | 108       | S   | L  | s | G  | М  | Е  | s  | Т  | v | L  | 16    |
| 12 | 131       | P   | L  | R | Н  | Α  | Т  | v  | L  | Т | L  | 15    |
| 13 | $264^{'}$ | R   | F  | s | к  | R  | R  | D  | s  | P | L  | 15    |
| 14 | 33        | L   | C  | s | L  | Y  | L  | I  | A  | v | L  | 14    |
| 15 | 109       | L   | s  | G | М  | E  | s  | Т  | V  | L | L  | 14    |
| 16 | 152       | v   | R  | G | Α  | A  | L  | М  | A  | P | L  | 14    |
| 17 | 205       | I   | I  | s | A  | 1  | G  | L  | D  | s | L  | 14    |
| 18 | 215       | L   | I  | s | F  | s  | Y  | L  | L  | I | L  | 14    |
| 19 | 268       | R   | R  | D | s  | P  | L  | P  | v  | I | ь  | 14    |
| 20 | 29        | L   | A  | F | P  | L  | C  | s  | L  | Y | L  | 13    |
| 21 | 148       | v   | Α  | A | v  | v  | R  | G  | A  | A | L  | 13    |
| 22 | 156       | A   | L  | М | A  | P  | L  | P  | v  | F | I  | 13    |
| 23 | 193       | D   | I  | R | V  | N  | V  | V  | Y  | G | L  | 13    |
| 24 | 221       | L   | L  | I |    | K  | Т  |    |    |   |    |       |
|    |           |     |    |   | L  |    |    | V  | L  | G | L  | 13    |
| 25 | 298       | K   | E  | I | R  | Q  | R  | I  | L  | R | L  | 13    |
| 26 | 7         | N   | E  | S | s  | A  | Т  | Y  | F  | I | L  | 12    |
| 27 | 19        | L   | P  | G | Г  | E  | E  | A  | Q  | F | W  | 12    |
| 28 | 24        | E   | A  | Q | F  | W  | L  | A  | F  | P | L  | 12    |
| 29 | 119       | A   | M  | A | F  | D  | R  | Y  | V  | A | Ι  | 12    |
| 30 | 129       | C   | Н  | P | L  | R  | Η  | A  | T  | V | L  | 12    |
| 31 | 206       | Ι   | S  | A | Ι  | G  | Ь  | D  | S  | L | L  | 12    |
| 32 | 219       | s   | Y  | L | L  | Ι  | L  | K  | T  | V | L  | 12    |
| 33 | 279       | N   | Ι  | Y | L  | L  | V  | Þ  | Р  | V | L  | 12    |
| 34 | 285       | P   | P  | V | L  | N  | Р  | r  | V  | Y | G  | 12    |
| 35 | 8         | E   | S  | S | Α  | T  | Y  | F  | I  | L | I  | 11    |
| 36 | 13        | Y   | F  | Ι | L  | I  | G  | L  | Р  | G | L  | 11    |
| 37 | 27        | F   | W  | L | Α  | F  | P  | L  | С  | S | L  | 11    |
| 38 | 48        | I   | Y  | Ι | V  | R  | T  | E  | H  | S | L  | 11    |
| 39 | 56        | S   | L  | Н | E  | P  | M  | Y  | I  | F | L  | 11    |
| 40 | 65        | L   | C  | M | L  | S  | G  | Ι  | D  | I | L  | 11    |
| 41 | 75        | I   | S  | T | S  | S  | M  | P  | K  | M | L  | 11    |
| 42 | 77        | T   | s  | S | М  | P  | K  | М  | L  | A | I  | 11    |
| 43 | 91        | S   | T  | T | Ι  | Q  | F  | D  | Α  | C | L  | 11    |
| 44 | 123       | D   | R  | Y | v  | A  | Ι  | С  | Н  | P | L  | 11    |
| 45 | 142       | R   | v  | Т | K  | 1  | G  | V  | Α  | A | V  | 11    |
| 46 | 180       | Y   | C  | L | Н  | Q  | D  | V  | M  | K | L  | 11    |
| 47 | 190       | Α   | C  | D | D  | Ι  | R  | v  | N  | V | V  | 11    |
| 48 | 212       | D   | s  | L | L  | I  | s  | F  | s  | Y | L  | 11    |
| 49 | 234       | Α   | Q  | A | ĸ  | Α  | F  | G  | Т  | С | V  | 11    |
| 50 | 242       | С   | v  | S | Н  | V  | С  | Α  | v  | F | I  | 11    |
| 51 | 248       | Α   | v  | F | I  | F  | Y  | v  | P  | F | I  | 11    |
| 52 | 250       | F   | I  | F | Y  | v  | Р  | F  | I  | G | L  | 11    |
| 53 | 254       | v   | P  | F | I  | G  | L  | s  | М  | v | Н  | 11    |
| 54 | 266       | S   | ĸ  | R | R  | D  | s  | P  | L  | P | v  | 11    |
| 55 | 267       | к   | R  | R | D  | s  | P  | L  | P  | v | I  | 11    |
| 56 | 269       | R   | D  | s | P  | L  | P  | v  | I  | L | A  | 11    |
| 57 | 278       | A   | N  | I | Y  | L  | L  | v  | P  | P | v  | 11    |
| 58 | 284       | v   | P  | P | v  | L  | N  | P  | I  | v | Y  | 11    |
| 59 | 289       | N   | P  | I | v  | Y  | G  | v  | K  | T | K  | 11    |
|    |           |     | -  | _ | -  | -  | ٠  | -  | •• | - | •• | 83    |
|    |           |     |    |   |    |    |    |    |    |   |    | 0.5   |

HLA-B\*0702 decamers(SEQ ID

NOS 2433-2492, respectively
in order of appearance)

Pos 1 2 3 4 5 6 7 8 9 0 score

60 296 KTKEIRQRIL 11

Table XXVIII, beginning at page 205, line 1, has been amended as follows:

Table XXVIII:

HLA Class II Epitopes (sample 15-mer length)

### (SEQ ID NOS 2493-2595, respectively in order of appearance) HLA-DRB1\*0101 15-mers

Pos score 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 1 200 YGLIVIISAIGLDSL 36 68 LSGIDILISTSSMPK 34 YIFLCMLSGIDILIS 3 62 33 4 103 I F A I H S L S G M E S T V L 32 5 LTIIYIVRTEHSLHE 45 31 6 193 DIRVNVVYGLIVIIS 31 7 LANIYLLVPPVLNPI 277 31 8 97 DACLLQIFAIHSLSG 30 9 106 IHSLSGMESTVLLAM 3.0 10 240 G T C V S H V C A V F I F Y V 30  $\mathbf{S}$  A  $\mathbf{T}$   $\mathbf{Y}$   $\mathbf{F}$   $\mathbf{I}$  L I  $\mathbf{G}$  L P  $\mathbf{G}$  L E  $\mathbf{E}$ 11 10 29 12 289 NPIVYGVKTKEIRQR 29 13 11 ATYFILIGLPGLEEA 28 14 250 F I F Y V P F I G L S M V H R 27 15 140 LPRVTKIGVAAVVRG 26 HQDVMKLACDDIRVN 16 183 26 17 217 S F S Y L L I L K T V L G L T 26 18 16 LIGLPGLEEAQFWLA 25 19 24 EAQFWLAFPLCSLYL 25 20 36  $\mathbf{L}\ \mathbf{Y}\ \mathbf{L}\ \mathbf{I}\ \mathbf{A}\ \mathbf{V}\ \mathbf{L}\ \mathbf{G}\ \mathbf{N}\ \mathbf{L}\ \mathbf{T}\ \mathbf{I}\ \mathbf{I}\ \mathbf{Y}\ \mathbf{I}$ 25 G I D I L I S T S S M P K M L 21 70 25 22 111 G M E S T V L L A M A F D R Y 25 148 VAAVVRGAALMAPLP 23 25 24 162 P V F I K Q L P F C R S N I L 25 25 197  $\textbf{N} \ \lor \ \lor \ \textbf{Y} \ \texttt{G} \ \textbf{L} \ \texttt{I} \ \lor \ \textbf{I} \ \texttt{I} \ \texttt{S} \ \texttt{A} \ \texttt{I} \ \texttt{G} \ \texttt{L}$ 25 26 211 LDSLLISFSYLLILK 25 27 218  $\mathbf{F}$  S Y  $\mathbf{L}$  L I L K  $\mathbf{T}$  V L G L T R 25 28 13 Y F I L I G L P G L E E A O F 24 AFPLCSLYLIAVLGN 29 30 24 3.0 39 24 77 TSSMPKMLAIFWFNS 31 24 32 85 AIFWFNSTTIQFDAC 24 137 33 V L T L P R V T K I G V A A V 24 34 151 V V R G A A L M A P L P V F I 24  $\mathbf{L} \ \mathsf{P} \ \mathsf{V} \ \mathbf{F} \ \mathsf{I} \ \mathsf{K} \ \mathsf{Q} \ \mathsf{L} \ \mathbf{P} \ \mathsf{F} \ \mathsf{C} \ \mathsf{R} \ \mathsf{S} \ \mathsf{N} \ \mathsf{I}$ 35 161 24 36 196 24

#### HLA-DRB1\*0101 15-mers

|    | Pos  | - | _ | _            |   | _ | _ | _ | _ | _      | ^ | - | 2            | 2            |    | _ | score |
|----|------|---|---|--------------|---|---|---|---|---|--------|---|---|--------------|--------------|----|---|-------|
|    | 0.00 | 1 | 2 | 3            | 4 | 5 | 6 | 7 | 8 | 9      | 0 | 1 | 2            | 3            | 4  | 5 | 0.4   |
| 37 | 202  | L | I | V            | I | I | S | A | I | G      | L | D | S            | L            | L  | I | 24    |
| 38 | 208  | A | I | G            | L | D | S | L | L | I      | S | F | S            | Y            | L  | L | 24    |
| 39 | 248  | A | Λ | F            | I | F | Y | V | P | F      | Ι | G | Г            | S            | M  | V | 24    |
| 40 | 251  | I | F | Y            | V | P | F | I | G | L      | S | M | V            | H            | R  | F | 24    |
| 41 | 83   | M | L | A            | I | F | W | F | N | S      | T | T | Ι            | Q            | F  | D | 23    |
| 42 | 101  | L | Q | Ι            | F | A | I | H | S | L      | S | G | M            | E            | S  | T | 23    |
| 43 | 165  | I | K | Q            | L | P | F | C | R | S      | И | I | L            | S            | H  | S | 23    |
| 44 | 203  | I | V | Ι            | I | S | A | Ι | G | L      | D | S | L            | L            | Ι  | S | 23    |
| 45 | 221  | L | L | 1            | L | K | T | V | L | G<br>- | L | Т | R            | E            | A  | Q | 23    |
| 46 | 278  | A | И | I            | Y | L | L | V | P | P      | V | L | И            | P            | Ι  | V | 23    |
| 47 | 27   | F | W | Г            | A | F | P | ь | C | S      | L | Y | L            | I            | A  | V | 22    |
| 48 | 35   | s | L | Y            | L | Ι | A | V | L | G      | N | L | Т            | Ι            | Ι  | Y | 22    |
| 49 | 61   | M | Y | Ι            | F | L | C | M | L | S      | G | I | D            | Ι            | L  | Ι | 22    |
| 50 | 65   | L | С | M            | L | S | G | I | D | I      | L | I | S            | $\mathbf{T}$ | S  | S | 22    |
| 51 | 80   | M | P | K            | М | L | Α | Ι | F | W      | F | N | S            | Т            | Т  | Ι | 22    |
| 52 | 145  | K | Ι | G            | V | A | A | V | V | R      | G | A | A            | L            | M  | A | 22    |
| 53 | 146  | I | G | V            | Α | A | V | V | R | G      | A | A | Ь            | M            | Α  | Ρ | 22    |
| 54 | 154  | G | A | Α            | L | М | A | Р | L | P      | V | F | Ι            | K            | Q  | L | 22    |
| 55 | 205  | I | Ι | S            | A | Ι | G | L | D | S      | L | L | I            | S            | F  | S | 22    |
| 56 | 243  | V | S | H            | V | С | Α | V | F | I      | F | Y | V            | Р            | F  | 1 | 22    |
| 57 | 270  | D | S | ₽            | L | Р | v | Ι | L | A      | И | Ι | Y            | L            | L  | V | 22    |
| 58 | 274  | P | V | Ι            | L | A | N | Ι | Y | L      | L | V | P            | P            | V  | L | 22    |
| 59 | 281  | Y | L | L            | V | Р | P | V | L | И      | P | Ι | V            | Y            | G  | V | 22    |
| 60 | 34   | C | S | $\mathbf{L}$ | Y | L | I | A | V | L      | G | N | L            | $\mathbf{T}$ | Ι  | Ι | 21    |
| 61 | 69   | S | G | Ι            | D | Ι | L | I | S | T      | S | S | M            | Р            | K  | M | 21    |
| 62 | 152  | V | R | G            | Α | A | L | М | Α | P      | L | Р | V            | F            | I  | K | 21    |
| 63 | 299  | E | Ι | R            | Q | R | I | L | R | L      | F | H | V            | A            | Т  | Н | 21    |
| 64 | 100  | L | L | Q            | I | F | A | Ι | Н | S      | L | S | G            | M            | Ε  | S | 20    |
| 65 | 135  | A | T | V            | L | Т | L | P | R | v      | Т | K | I            | G            | V  | A | 20    |
| 66 | 141  | P | R | V            | Т | K | I | G | V | A      | A | V | V            | R            | G  | A | 20    |
| 67 | 191  | C | D | D            | I | R | V | N | V | v      | Y | G | L            | Ι            | V  | 1 | 20    |
| 68 | 199  | v | Y | G            | L | Ι | V | I | Ι | S      | A | I | G            | L            | D  | S | 20    |
| 69 | 262  | v | Н | R            | F | S | K | R | R | D      | S | P | $\mathbf{L}$ | P            | V  | 1 | 20    |
| 70 | 271  | S | P | L            | P | V | I | L | A | N      | Ι | Y | L            | L            | V  | P | 20    |
| 71 | 28   | W | L | A            | F | P | L | C | S | L      | Y | L | I            | Α            | V  | L | 19    |
| 72 | 58   | H | E | Р            | M | Y | I | F | L | С      | M | L | S            | G            | I  | D | 19    |
| 73 | 59   | E | P | M            | Y | Ι | F | L | С | M      | L | S | G            | Ι            | D  | Ι | 19    |
| 74 | 60   | P | M | Y            | I | F | L | C | M | L      | S | G | Ι            | D            | Ι  | L | 19    |
| 75 | 98   | A | С | L            | L | Q | I | F | A | I      | Н | S | L            | S            | G  | M | 19    |
| 76 | 215  | L | Ι | . s          | F | S | Y | L | L | I      | Ь | K | $\mathbf{T}$ | V            | L  | G | 19    |
| 77 | 219  | S | Y |              | L | Ι | L | K | Т | V      | L | G | L            | Т            | R  | E | 19    |
| 78 | 228  | L | G | L            | T | R | Е | Α | Q | Α      | K | A | F            | G            | T  | C | 19    |
| 79 | 232  | R | E | A            | Q | A | K | A | F | G      | T | С | V            | S            | Н  | V | 19    |
| 80 | 246  | v | С | A            | V | F | I | F | Y | v      | Þ | F | Ι            | G            | L  | S | 19    |
| 81 | 297  | T | K | E            | I | R | Q | R | Ι | L      | R | L | F            | H            | V  | A | 19    |
| 82 | 3    | D | P | N            | G | N | E | S | S | A      | T | Y | F            | Ι            | L  | Ι | 18    |
| 83 | 14   | F | Ι | L            | I | G | L | Р | G | L      | Ε | Е | A            | Q            | F  | W | 18    |
| 84 | 25   | A | Q | F'           | W | L | A | F | P | L      | С | S | L            | Y            | Ь  | Ι | 18    |
| 85 | 42   | L | G | И            | L | Т | Ι | Ι | Y | I      | V | R | T            | E            | H  | S | 18    |
| 86 | 46   | T | Ι | Ι            | Y | I | V | R | Т | E      | Н | S | L            | Н            | Е  | P | 18    |
| 87 | 78   | s | S | M            | P | K | М | L | A | I      | F | W | F            | N            | S  | т | 18    |
|    |      |   |   |              |   |   |   |   |   |        |   |   |              | 8            | 35 |   |       |

#### HLA-DRB1\*0101 15-mers

|     | Dog |   |   |   |   |   |   |   |   |   |              |              |   |              |   |   |       |
|-----|-----|---|---|---|---|---|---|---|---|---|--------------|--------------|---|--------------|---|---|-------|
|     | Pos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0            | 1            | 2 | 3            | 4 | 5 | score |
| 88  | 84  | L | Α | Ι | F | W | F | N | S | T | $\mathbf{T}$ | 1            | Q | F            | D | Α | 18    |
| 89  | 89  | F | N | S | T | Т | I | Q | F | D | Α            | С            | L | $\mathbf{L}$ | Q | I | 18    |
| 90  | 93  | T | I | Q | F | D | A | С | L | L | Q            | I            | F | Α            | Ι | Н | 18    |
| 91  | 115 | T | V | L | L | Α | M | Α | F | D | R            | Y            | V | Α            | I | C | 18    |
| 92  | 119 | A | М | Α | F | D | R | Y | V | A | Ι            | C            | Н | P            | L | R | 18    |
| 93  | 127 | A | Ι | С | H | P | L | R | H | A | $\mathbf{T}$ | V            | L | Т            | L | P | 18    |
| 94  | 129 | C | Н | Р | L | R | н | Α | Т | v | L            | $\mathbf{T}$ | L | Р            | R | V | 18    |
| 95  | 147 | G | V | Α | A | V | v | R | G | A | Α            | L            | М | Α            | Р | L | 18    |
| 96  | 149 | A | Α | V | v | R | G | Α | Α | L | М            | Α            | P | L            | P | V | 18    |
| 97  | 216 | I | S | F | S | Y | L | L | I | L | K            | $\mathbf{T}$ | V | L            | G | L | 18    |
| 98  | 227 | v | L | G | L | Т | R | E | Α | Q | Α            | K            | A | F            | G | Т | 18    |
| 99  | 249 | v | F | I | F | Y | v | P | F | I | G            | L            | S | M            | V | Н | 18    |
| 100 | 253 | Y | V | P | F | I | G | L | S | M | V            | Н            | R | F            | S | K | 18    |
| 101 | 284 | v | P | P | v | L | N | P | I | v | Y            | G            | V | K            | Т | K | 18    |
| 102 | 286 | P | V | L | N | P | I | V | Y | G | V            | K            | Т | K            | Е | I | 18    |
| 103 | 303 | R | Ι | L | R | L | F | Н | V | Α | Т            | Н            | Α | S            | Е | Р | 18    |

# HLA-DRB1\*0301 (DR17) 15-mers (SEQ ID NOS 2596-2671, respectively in order of appearance)

|    | _   |              |                      |              |   |   |   |   |              |   |   |              |              |     |              |   |       |
|----|-----|--------------|----------------------|--------------|---|---|---|---|--------------|---|---|--------------|--------------|-----|--------------|---|-------|
|    | Pos | 1            | 2                    | 3            | 4 | 5 | 6 | 7 | 8            | 9 | 0 | 1            | 2            | . 3 | 4            | 5 | score |
| 1  | 16  | L            | I                    | G            | L | P | G | L | Е            | E | A | Q            | F            | M   | L            | Α | 26    |
| 2  | 206 | I            | s                    | Α            | I | G | L | D | s            | L | L | I            | s            | F   | s            | Y | 23    |
| 3  | 91  | s            | $^{\circ}\mathbf{T}$ | $\mathbf{T}$ | I | Q | F | D | Α            | C | L | L            | Q            | I   | F            | Α | 22    |
| 4  | 117 | L            | L                    | Α            | M | Α | F | D | R            | Y | V | Α            | I            | С   | Н            | P | 22    |
| 5  | 38  | L            | I                    | Α            | v | L | G | N | L            | T | I | I            | Y            | I   | V            | R | 21    |
| 6  | 179 | S            | Y                    | С            | L | Н | Q | D | V            | M | K | L            | Α            | С   | D            | D | 21    |
| 7  | 211 | L            | D                    | S            | L | L | I | S | F            | S | Y | L            | L            | I   | $\mathbf{L}$ | K | 21    |
| 8  | 219 | S            | Y                    | L            | L | I | L | K | $\mathbf{T}$ | v | L | G            | L            | Т   | R            | E | 21    |
| 9  | 272 | P            | L                    | ₽            | v | I | L | A | N            | I | Y | L            | L            | V   | P            | P | 21    |
| 10 | 26  | Q            | F                    | M            | L | А | F | P | L            | C | S | L            | Y            | L   | Ι            | Α | 20    |
| 11 | 114 | s            | T                    | V            | L | L | A | М | А            | F | D | R            | Y            | V   | Α            | Ι | 20    |
| 12 | 129 | C            | Н                    | P            | L | R | H | Α | $\mathbf{T}$ | v | L | $\mathbf{T}$ | $\mathbf{L}$ | P   | R            | V | 20    |
| 13 | 134 | H            | Α                    | T            | v | L | T | L | P            | R | V | Т            | K            | Ι   | G            | V | 20    |
| 14 | 186 | v            | М                    | K            | L | A | C | D | D            | I | R | V            | N            | V   | V            | Y | 20    |
| 15 | 200 | Y            | G                    | L            | I | V | I | I | S            | A | Ι | G            | L            | D   | S            | Ь | 20    |
| 16 | 270 | D            | S                    | P            | L | P | v | I | L            | A | N | I            | Y            | L   | L            | V | 20    |
| 17 | 297 | T            | K                    | E            | I | R | Q | R | I            | L | R | L            | F            | H   | V            | А | 20    |
| 18 | 11  | A            | T                    | Y            | F | Ι | L | Ι | G            | L | P | G            | L            | E   | Е            | A | 19    |
| 19 | 54  | $\mathbf{E}$ | Н                    | S            | L | Н | E | P | М            | Y | 1 | F            | L            | С   | М            | L | 19    |
| 20 | 106 | I            | Н                    | S            | L | S | G | M | Ē            | S | T | V            | $\mathbf{L}$ | L   | A            | M | 19    |
| 21 | 165 | I            | K                    | Q            | L | P | F | С | R            | S | N | I            | $\mathbf{L}$ | S   | H            | S | 19    |
| 22 | 191 | С            | D                    | D            | I | R | v | N | V            | V | Y | G            | L            | I   | V            | Ι | 19    |
| 23 | 203 | I            | V                    | Ι            | I | S | Α | 1 | G            | L | D | S            | L            | L   | Ι            | s | 19    |
| 24 | 213 | S            | L                    | L            | I | s | F | S | Y            | L | L | Ι            | L            | K   | $\mathbf{T}$ | V | 19    |
| 25 | 224 | L            | K                    | $\mathbf{T}$ | V | L | G | L | Т            | R | E | Α            | Q            | А   | K            | Α | 19    |
| 26 | 227 | v            | L                    | G            | L | T | R | E | А            | Q | Α | K            | Α            | F   | G            | Т | 19    |
| 27 | 248 | A            | V                    | F            | I | F | Y | V | P            | F | Ι | G            | $\mathbf{L}$ | s   | M            | V | 19    |
| 28 | 254 | v            | P                    | F            | I | G | L | S | M            | v | Н | R            | F            | s   | K            | R | 19    |
| 29 | 277 | L            | A                    | N            | I | Y | L | L | V            | P | P | V            | L            | N   | P            | Ι | 19    |
|    |     |              |                      |              |   |   |   |   |              |   |   |              |              | 8   | 36           |   |       |
|    |     |              |                      |              |   |   |   |   |              |   |   |              |              |     |              |   |       |

HLA-DRB1\*0301 (DR17) 15-mers

(SEQ ID NOS 2596-2671, respectively
in order of appearance)

|    | Pos | 1 | 2 | 3 | 4      | 5 | 6 | 7      | 8 | 9      | 0 | 1 | 2 | 3 | 4 | 5      | score |
|----|-----|---|---|---|--------|---|---|--------|---|--------|---|---|---|---|---|--------|-------|
| 30 | 36  | L | Y | L | I      | A | v | L      | G | N      | L | Т | Ι | Ι | Y | Ι      | 18    |
| 31 | 93  | т | I | Q | F      | D | A | С      | L | L      | Q | Ι | F | Α | Ι | Н      | 18    |
| 32 | 98  | A | C | L | L      | Q | I | F      | A | I      | H | s | L | s | G | M      | 18    |
| 33 | 125 | Y | v | A | I      | Ĉ | н | P      | L | R      | Н | A | т | V | L | Т      | 18    |
| 34 | 158 | M | Ā | P | L      | P | v | F      | I | ĸ      | 0 | L | P | F | C | R      | 18    |
| 35 | 187 | м | K | L | A      | C | D | D      | I | R      | v | N | v | V | Y | G      | 18    |
| 36 | 217 | s | F | S | Y      | L | L | I      | L | ĸ      | T | V | L | G | L | Т      | 18    |
| 37 | 225 | ĸ | T | V | L      | G | L | T      | R | E      | A | Q | A | K | A | F      | 18    |
| 38 | 281 | Y | L | L | v      | P | P | V      | L | N      | Р | I | V | Y | G | V      | 18    |
| 39 | 288 | L | N | P | I      | v | Y | G      | v | K      | Т | K | E | Ī | R | Q      | 18    |
| 40 | 18  | G | L | P | G      | L | E | E      | A | Q      | F | W | L | A | F | P      | 17    |
| 41 | 44  | N | L | T | I      | I | Y | I      | V | R      | Т | E | Н | S | L | Н      | 17    |
| 42 | 145 | K | I | G | v      | A | A | V      | V | R      | G | A | A | L | М | A      | 17    |
| 43 | 159 | A | P | L | P      | v | F | I      | K | Q      | L | P | F | С | R | S      | 17    |
| 44 | 256 | F | I | G | L      | s | M | A<br>T | Н | R      | F | S | K | R | R | D      | 17    |
| 45 | 259 | L | S | M | A      | Н | R | F      | S | K      | R | R | D | S | P | ь      | 17    |
|    |     | A | L |   |        |   |   |        |   | K      | I | G |   | A | A | A<br>P | 16    |
| 46 | 137 |   |   | T | L      | P | R | V      | T |        | S |   | V |   | V | I      |       |
| 47 | 262 | V | H | R | F      | S | K | R      | R | D      |   | P | L | P |   |        | 16    |
| 48 | 294 | G | V | K | T      | K | E | I      | R | Q      | R | I | L | R | L | F      | 16    |
| 49 | 46  | T | I | I | Y      | I | V | R      | Т | E      | Н | S | L | H | Ε | P      | 15    |
| 50 | 51  | V | R | T | E      | H | S | L      | H | E      | P | M | Y | I | F | L      | 15    |
| 51 | 172 | R | S | N | I      | Г | S | Н      | S | Y      | C | L | H | Q | D | V      | 15    |
| 52 | 189 | L | A | C | D      | D | I | R      | V | N      | V | V | Y | G | L | I      | 15    |
| 53 | 212 | D | S | Г | L      | Ι | S | F      | S | Y      | L | L | I | L | K | T      | 15    |
| 54 | 218 | F | S | Y | L      | L | I | L      | K | T      | V | L | G | L | T | R      | 15    |
| 55 | 271 | s | P | L | P      | V | Ι | Г      | A | N      | Ι | Y | Г | L | V | P      | 15    |
| 56 | 279 | И | I | Y | L      | L | V | P      | P | V      | L | N | Б | Ι | V | Y      | 15    |
| 57 | 12  | T | Y | F | I      | L | I | G      | L | P      | G | L | E | E | A | Q      | 14    |
| 58 | 35  | S | L | Y | L      | I | A | V      | L | G      | N | L | T | Ι | I | Y      | 14    |
| 59 | 64  | F | Г | C | M      | Г | S | G      | I | D      | I | L | I | S | T | S      | 14    |
| 60 | 140 | L | Þ | R | V      | Т | K | I      | G | V      | A | A | V | V | R | G      | 14    |
| 61 | 273 | L | P | V | I      | L | A | N      | Ι | Y      | L | L | V | P | P | V      | 14    |
| 62 | 301 | R | Q | R | I      | L | R | L      | F | Н      | V | A | Т | H | A | S      | 14    |
| 63 | 13  | Y | F | I | L      | I | G | L      | P | G      | L | E | E | A | Q | F      | 13    |
| 64 | 47  | I | I | Y | I      | V | R | T      | Ε | H      | S | L | Н | E | P | M      | 13    |
| 65 | 71  | I | D | I | L      | I | S | T      | S | S      | M | P | K | M | L | A      | 13    |
| 66 | 80  | M | P | K | M      | L | A | Ι      | F | W      | F | N | S | T | T | I      | 13    |
| 67 | 109 | L | S | G | M      | E | S | T      | V | L      | L | A | M | A | F | D      | 13    |
| 68 | 113 | E | S | T | V      | L | L | A      | M | A      | F | D | R | Y | V | A      | 13    |
| 69 | 135 | A | Т | V | L      | Т | L | P      | R | V      | Т | K | I | G | V |        | 13    |
| 70 | 195 | R | V | N | V<br>- | ٧ | Y | G      | L | I      | V | I | Ι | S | A | I      | 13    |
| 71 | 202 | L | I | V | I      | Ι | S | A      | Ι | G<br>- | L | D | S | L | L | I      | 13    |
| 72 | 220 | Y | L | L | I      | Г | K | Т      | V | L      | G | L | T | R | E | A      | 13    |
| 73 | 221 | L | L | Ι | L      | K | T | V      | L | G      | L | T | R | E | A | Q      | 13    |
| 74 | 264 | R | F | S | K      | R | R | D      | S | P      | Г | P | V | Ι | L | A      | 13    |
| 75 | 280 | I | Y | L | L      | V |   | P      | V | L      | N | P | I | V | Y | G      | 13    |
| 76 | 302 | Q | R | 1 | L      | R | L | F      | Н | V      | Α | Т | Н | A | S | E      | 13    |

# HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

|    |     |          |   |              |   |              |   |        |   | <u></u>      |   |   |   |              |              |              |       |
|----|-----|----------|---|--------------|---|--------------|---|--------|---|--------------|---|---|---|--------------|--------------|--------------|-------|
|    | Pos | 1        | 2 | 3            | 4 | 5            | 6 | 7      | 8 | 9            | 0 | 1 | 2 | 3            | 4            | 5            | score |
| 1  | 36  | L        | Y | L            | I | A            | v | L      | G | N            | L | Т | I | I            | Y            | I            | 26    |
| 2  |     | L        | Т | I            | I | Y            | ĭ | A<br>P | R | Т            | E | Н | s | L            | Н            | E            | 26    |
|    | 45  |          |   |              |   |              |   |        |   | s            | Т | S | S | М            | P            |              | 26    |
| 3  | 68  | L        | S | G            | I | D            | I | L      | I |              |   |   |   |              |              | K            |       |
| 4  | 83  | M        | L | A            | I | F            | W | F      | N | s<br>-       | T | T | I | Q            | F            | D            | 26    |
| 5  | 134 | H        | A | T            | v | L            | T | L      | Р | R            | V | Т | K | Ι            | G            | V            | 26    |
| 6  | 145 | K        | Ι | G            | v | Α            | A | v      | V | R            | G | Α | А | L            | М            | A            | 26    |
| 7  | 224 | L        | K | Т            | v | L            | G | L      | Т | R            | E | A | Q | Α            | K            | A            | 26    |
| 8  | 227 | v        | L | G            | L | T            | R | E      | A | Q            | A | K | Α | F            | G            | Т            | 26    |
| 9  | 256 | F        | I | G            | L | S            | M | v      | H | R            | F | S | K | R            | R            | D            | 26    |
| 10 | 281 | Y        | L | L            | v | Р            | P | V      | L | N            | Р | Ι | V | Y            | G            | V            | 26    |
| 11 | 289 | N        | P | Ι            | v | Y            | G | V      | K | T            | K | Ε | I | R            | Q            | R            | 26    |
| 12 | 301 | R        | Q | R            | I | L            | R | L      | F | H            | V | Α | Т | H            | Α            | S            | 26    |
| 13 | 11  | A        | Т | Y            | F | Ι            | L | I      | G | L            | P | G | L | E            | E            | Α            | 22    |
| 14 | 24  | E        | Α | Q            | F | W            | L | A      | F | P            | L | С | S | $\mathbf{L}$ | Y            | L            | 22    |
| 15 | 25  | A        | Q | F            | W | $\mathbf{L}$ | A | F      | P | L            | C | S | L | Y            | $\mathbf{L}$ | 1            | 22    |
| 16 | 34  | C        | s | $\mathbf{L}$ | Y | L            | I | A      | V | L            | G | N | L | Т            | I            | I            | 22    |
| 17 | 84  | L        | Α | I            | F | W            | F | N      | s | $\mathbf{T}$ | Т | I | Q | F            | D            | Α            | 22    |
| 18 | 122 | F        | D | R            | Y | V            | A | I      | C | н            | P | L | R | Н            | Α            | $\mathbf{T}$ | 22    |
| 19 | 197 | N        | v | V            | Y | G            | L | I      | V | r            | Ι | S | Α | Ι            | G            | L            | 22    |
| 20 | 215 | L        | Ι | s            | F | s            | Y | L      | L | I            | L | K | Т | V            | L            | G            | 22    |
| 21 | 217 | s        | F | s            | Y | L            | L | I      | L | ĸ            | Т | V | L | G            | L            | $\mathbf{T}$ | 22    |
| 22 | 250 | F        | Ι | F            | Y | v            | P | F      | Ι | G            | L | s | М | v            | Н            | R            | 22    |
| 23 | 278 | A        | N | Ι            | Y | L            | L | v      | P | P            | v | L | N | P            | I            | v            | 22    |
| 24 | 19  | L        | Р | G            | L | Е            | E | Α      | Q | F            | W | L | Α | F            | Р            | L            | 20    |
| 25 | 30  | Α        | F | P            | L | С            | s | L      | Y | L            | I | Α | v | L            | G            | N            | 20    |
| 26 | 33  | L        | С | s            | L | Y            | L | I      | Α | v            | L | G | N | L            | т            | I            | 20    |
| 27 | 35  | s        | L | Y            | L | I            | Α | v      | L | G            | N | L | Т | I            | Ι            | Y            | 20    |
| 28 | 39  | I        | А | v            | L | G            | N | L      | Т | I            | Ι | Y | Ι | v            | R            | $\mathbf{T}$ | 20    |
| 29 | 42  | L        | G | N            | L | т            | I | I      | Y | I            | V | R | т | Ē            | Н            | s            | 20    |
| 30 | 44  | N        | L | т            | I | I            | Y | I      | v | R            | т | E | Н | s            | $\mathbf{L}$ | Н            | 20    |
| 31 | 48  | I        | Y | Ι            | v | R            | T | E      | н | s            | L | н | Е | P            | М            | Y            | 20    |
| 32 | 58  | н        | E | P            | м | Y            | I | F      | L | C            | М | L | s | G            | I            | D            | 20    |
| 33 | 62  | Y        | I | F            | L | C            | M | L      | s | G            | Ι | D | I | L            | I            | s            | 20    |
| 34 | 65  | L        | C | М            | L | s            | G | I      | D | I            | L | I | s | Т            | s            | s            | 20    |
| 35 | 71  | ī        | D | I            | L | I            | s | T      | S | s            | М | P | K | М            | L            | Ā            | 20    |
| 36 | 80  | M        | P | ĸ            | м | L            | A | I      | F | W            | F | N | s | т            | T            | Ι            | 20    |
| 37 | 81  | P        | K | М            | L | A            | I | F      | W | F            | N | s | Т | T            | Ī            | Q            | 20    |
| 38 | 91  | s        | Т | Т            | I | Q            | F | D      | A | C            | L | L | Q | I            | F            | ×            | 20    |
| 39 | 97  | D        | A | C            | L | L            | Q | I      | F | A            | I | Н | S | L            | s            | G            | 20    |
| 40 |     |          | C | Ь            |   | Q            | _ | F      | Α | I            | Н | S | L | S            | G            | М            | 20    |
|    |     | L        | L |              |   | F            | A |        | Н | s            | L | S | G | М            | E            | S            | 20    |
| 41 |     | I        | F | Q<br>A       | I |              |   | I      | S | G            | М | E | S | Т            | V            | L            |       |
| 42 |     |          |   | A            | I | Н            | S | L      |   |              |   |   |   | L            |              |              | 20    |
| 43 | 106 | I        | Н | S            | L | S            | G | M      | Е | S            | T | V | L |              | A            | M            | 20    |
| 44 |     | T        | V |              | L | A            | M | A      | F | D            | R | Y | V | A            | I            | C            | 20    |
| 45 |     | L        | L | A            | M | A            | F | D      | R | Y            | V | A | I | C            | H            | P            | 20    |
| 46 |     | Y        | V | A            | I | C            | H | P      | L | R            | H | A | T | V            | Г            | T            | 20    |
| 47 |     | C        | H | P            | L | R            | H | A      | T | V            | L | T | Ь | P            | R            | V            | 20    |
| 48 |     | <b>v</b> | L | T            | L | P            | R | V      | T | K            | I | G | ٧ | A            | A            | V            | 20    |
| 49 | 140 | L        | P | R            | V | Т            | K | Ι      | G | ٧            | A | A | V |              | R            | G            | 20    |
| ,  |     |          |   |              |   |              |   |        |   |              |   |   |   | 5            | 38           |              |       |

HLA-DRB1\*0401 (DR4Dw4) 15-mers
(SEQ ID NOS 2672-2805, respectively
in order of appearance)

|    | Pos | 1  | 2 | _            | 4      | 5 | _             | 7             | 0            |               | ^      | -      | _      | _      |              | _            | score |
|----|-----|----|---|--------------|--------|---|---------------|---------------|--------------|---------------|--------|--------|--------|--------|--------------|--------------|-------|
| 50 | 155 | A  | A | 3<br>L       | M      | A | 6<br><b>P</b> | 7<br><b>L</b> | 8<br>P       | 9<br><b>V</b> | 0<br>F | 1<br>I | 2<br>K | 3      | 4<br>L       | 5<br>D       | 20    |
| 51 | 162 | P  | V | F            | I      |   |               |               |              |               |        |        |        | Q<br>N |              | P            | 20    |
| 52 | 165 | I  | K |              | L      | K | Q             | C             | P            | F             | C      | R      | S      |        | I            | L            | 20    |
| 53 | 179 | S  | Y | C<br>Q       | L      | P | F             |               | R<br>V       | S             | N      | Ι      | L      | S      | H            | S            | 20    |
|    |     |    |   |              |        |   | Q             | D             |              | M             | K      | Г      | A      | C      | D            | D            | 20    |
| 54 | 183 | H  | Q | D            | V      | M | K             | L             | A            | C             | D      | D      | Ι      | R      | V            | N            | 20    |
| 55 | 186 | V  | M | K            | L      | A | C             | D             | D            | I             | R      | V      | N      | V      | V            | Y            | 20    |
| 56 | 193 | D  | I | R            | V      | N | V             | V             | Y            | G             | L      | I      | V      | I      | I            | S            | 20    |
| 57 | 196 | V  | N | V            | V      | Y | G             | L             | I            | V             | I      | I      | S      | A      | I            | G            | 20    |
| 58 | 199 | V  | Y | G            | L      | Ι | V             | I             | Ι            | S             | A      | I      | G      | L      | D            | S            | 20    |
| 59 | 200 | Y  | G | L            | I      | V | I             | I             | S            | A             | I      | G      | L      | D      | S            | L            | 20    |
| 60 | 202 | L  | I | V            | I      | Ι | S             | A<br>-        | I            | G<br>-        | L      | D      | S      | L      | L            | I            | 20    |
| 61 | 203 | I  | V | I            | I      | S | A             | I             | G            | L             | D      | S      | L      | L      | I            | S            | 20    |
| 62 | 206 | I  | S | A            | I<br>- | G | L             | D             | S            | L             | L      | I      | S      | F      | S            | Y            | 20    |
| 63 | 208 | A. | I | G            | L      | D | S             | L             | L            | I             | S      | F      | S      | Y      | L            | L            | 20    |
| 64 | 211 | L  | D | S            | L      | L | I             | s             | F            | S             | Y      | L      | L      | Ι      | L            | K            | 20    |
| 65 | 212 | D  | S | L            | L      | I | S             | F             | S            | Y             | L      | L      | Ι      | L      | K            | Т            | 20    |
| 66 | 218 | F  | S | Y            | L      | L | Ι             | L             | K            | T             | V      | L      | G      | L      | Т            | R            | 20    |
| 67 | 240 | G  | Т | C            | V      | S | Н             | v             | С            | A             | V      | F      | Ι      | F      | Y            | V            | 20    |
| 68 | 243 | v  | S | H            | V      | C | A             | V             | F            | I             | F      | Y      | V      | P      | F            | Ι            | 20    |
| 69 | 246 | V  | C | A            | V      | F | I             | F             | Y            | V             | Р      | F      | Ι      | G      | L            | S            | 20    |
| 70 | 248 | A  | V | F            | I      | F | Y             | V             | Р            | F             | I      | G      | L      | S      | М            | V            | 20    |
| 71 | 251 | I  | F | Y            | V      | Р | F             | I             | G            | L             | S      | M      | V      | H      | R            | F            | 20    |
| 72 | 272 | P  | L | P            | V      | Ι | L             | Α             | N            | I             | Y      | L      | L      | V      | Р            | Р            | 20    |
| 73 | 277 | L  | Α | N            | I      | Y | L             | L             | V            | P             | P      | V      | L      | N      | P            | Ι            | 20    |
| 74 | 285 | P  | Ρ | V            | L      | N | P             | I             | V            | Y             | G      | V      | K      | T      | K            | Ε            | 20    |
| 75 | 18  | G  | L | Ь            | G      | L | E             | E             | Α            | Q             | F      | W      | L      | A      | F            | P            | 18    |
| 76 | 27  | F  | W | L            | Α      | F | P             | L             | C            | S             | L      | Y      | L      | Ι      | Α            | V            | 18    |
| 77 | 69  | S  | G | I            | D      | Ι | L             | I             | S            | T             | S      | S      | M      | P      | K            | M            | 18    |
| 78 | 94  | Ι  | Q | F            | D      | A | С             | L             | L            | Q             | I      | F      | A      | I      | Η            | S            | 18    |
| 79 | 99  | С  | L | L            | Q      | Ι | F             | A             | Ι            | H             | S      | L      | S      | G      | М            | E            | 18    |
| 80 | 107 | H  | S | L            | S      | G | M             | E             | S            | T             | V      | L      | L      | A      | M            | A            | 18    |
| 81 | 116 | V  | L | L            | A      | M | A             | F             | D            | R             | Y      | V      | A      | Ι      | C            | Н            | 18    |
| 82 | 126 | V  | Α | Ι            | C      | H | P             | L             | R            | H             | A      | T      | V      | L      | $\mathbf{T}$ | $\mathbf{L}$ | 18    |
| 83 | 164 | F  | Ι | K            | Q      | L | P             | F             | С            | R             | S      | N      | I      | L      | S            | Н            | 18    |
| 84 | 176 | L  | S | H            | S      | Y | С             | L             | Н            | Q             | D      | V      | M      | K      | L            | A            | 18    |
| 85 | 187 | M  | K | L            | A      | С | D             | D             | Ι            | R             | V      | И      | V      | V      | Y            | G            | 18    |
| 86 | 205 | I  | 1 | S            | Α      | Ι | G             | L             | D            | s             | L      | L      | Ι      | S      | F            | S            | 18    |
| 87 | 233 | E  | A | Q            | A      | K | A             | F             | G            | T             | C      | V      | S      | Η      | V            | С            | 18    |
| 88 | 237 | K  | A | F            | G      | Т | C             | V             | Ş            | н             | V      | C      | Α      | V      | F            | Ι            | 18    |
| 89 | 271 | S  | Р | L            | P      | V | Ι             | L             | Α            | И             | Ι      | Y      | L      | L      | V            | Р            | 18    |
| 90 | 293 | Y  | G | V            | K      | T | K             | E             | I            | R             | Q      | R      | I      | L      | R            | L            | 18    |
| 91 | 294 | G  | V | K            | T      | K | E             | I             | R            | Q             | R      | I      | L      | R      | L            | F            | 18    |
| 92 | 10  | S  | Α | $\mathbf{T}$ | Y      | F | I             | L             | Ι            | G             | L      | P      | G      | L      | E            | E            | 16    |
| 93 | 28  | W  | L | A            | F      | P | L             | C             | S            | L             | Y      | L      | Ι      | A      | V            | ${f L}$      | 16    |
| 94 | 59  | E  | P | М            | Y      | I | F             | L             | С            | M             | L      | s      | G      | Ι      | D            | 1            | 16    |
| 95 | 61  | M  | Y | I            | F      | L | C             | M             | L            | s             | G      | I      | D      | I      | L            | 1            | 16    |
| 96 | 85  | A  | Ι | F            | W      | F | N             | s             | $\mathbf{T}$ | T             | 1      | Q      | F      | D      | Α            | С            | 16    |
| 97 | 101 | L  | Q | I            | F      | A | I             | н             | S            | L             | S      | G      | M      | E      | s            | Т            | 16    |
| 98 | 177 | s  | Н | s            | Y      | С | L             | H             | Q            | D             | V      | М      | K      | L      | A            | C            | 16    |
|    |     |    |   |              |        |   |               |               |              |               |        |        |        | 8      | 39           |              |       |
|    |     |    |   |              |        |   |               |               |              |               |        |        |        |        |              |              |       |

# HLA-DRB1\*0401 (DR4Dw4) 15-mers (SEQ ID NOS 2672-2805, respectively in order of appearance)

|     | Pos |   | _            | _            |   | _            | _ | _  | _            | _ | _ | _            | _ | _            |              | _            | score |
|-----|-----|---|--------------|--------------|---|--------------|---|----|--------------|---|---|--------------|---|--------------|--------------|--------------|-------|
|     |     | 1 | 2            | 3            | 4 | 5            | 6 | 7  | 8            | 9 | 0 | 1            | 2 | 3            | 4            | 5            |       |
| 99  | 236 | A | K            | A            | F | G            | T | C  | V            | S | H | V            | C | A            | V            | F            | 16    |
| 100 | 249 | V | F            | I            | F | Y            | v | P  | F            | Ι | G | L            | S | M            | V            | H            | 16    |
| 101 | 253 | Y | V            | P            | F | Ι            | G | L  | S            | M | V | Н            | R | F            | S            | K            | 16    |
| 102 | 13  | Y | F            | Ι            | L | I            | G | L  | Р            | G | L | E            | E | Α            | Q            | F            | 14    |
| 103 | 14  | F | Ι            | L            | I | G            | L | P  | G            | L | Е | Е            | A | Q            | F            | W            | 14    |
| 104 | 16  | L | Ι            | G            | L | Р            | G | L  | Е            | E | Α | Q            | F | W            | L            | A            | 14    |
| 105 | 38  | L | 1            | А            | v | $\mathbf{L}$ | G | N  | $\mathbf{L}$ | T | 1 | Ι            | Y | 1            | V            | R            | 14    |
| 106 | 47  | I | Ι            | Y            | I | V            | R | T  | E            | н | S | $\mathbf{L}$ | H | E            | Р            | M            | 14    |
| 107 | 54  | E | Н            | S            | L | Н            | E | P  | М            | Y | I | F            | L | С            | M            | L            | 14    |
| 108 | 60  | P | М            | Y            | I | F            | L | C  | М            | L | S | G            | I | D            | I            | $\mathbf{L}$ | 14    |
| 109 | 64  | F | L            | С            | M | L            | S | G  | I            | D | Ι | L            | I | s            | $\mathbf{T}$ | S            | 14    |
| 110 | 70  | G | 1            | D            | I | L            | I | S  | Т            | s | s | M            | P | K            | М            | L            | 14    |
| 111 | 72  | D | 1            | L            | I | S            | T | s  | S            | M | Р | K            | M | $\mathbf{L}$ | Α            | Ι            | 14    |
| 112 | 109 | L | S            | G            | M | E            | S | T' | V            | L | L | А            | М | Α            | F            | D            | 14    |
| 113 | 113 | E | S            | $\mathbf{T}$ | v | L            | L | A  | М            | A | F | D            | R | Y            | V            | Α            | 14    |
| 114 | 135 | A | $\mathbf{T}$ | V            | L | $\mathbf{T}$ | L | P  | R            | v | Т | K            | 1 | G            | V            | Α            | 14    |
| 115 | 143 | v | $\mathbf{T}$ | K            | I | G            | v | A  | Α            | v | v | R            | G | Α            | A            | L            | 14    |
| 116 | 148 | v | Α            | Α            | v | V            | R | G  | Α            | A | L | М            | А | Р            | L            | P            | 14    |
| 117 | 149 | A | À            | V            | v | R            | G | A  | Α            | L | М | Α            | P | L            | P            | V            | 14    |
| 118 | 154 | G | Α            | Α            | L | М            | A | P  | L            | P | v | F            | I | K            | Q            | L            | 14    |
| 119 | 158 | M | Α            | Р            | L | P            | v | F  | I            | K | Q | L            | Р | F            | С            | R            | 14    |
| 120 | 173 | S | N            | I            | L | S            | H | S  | Y            | C | L | Η            | Q | D            | V            | М            | 14    |
| 121 | 184 | Q | D            | V            | М | K            | L | A  | C            | D | D | I            | R | V            | N            | V            | 14    |
| 122 | 191 | C | D            | D            | I | R            | v | N  | V            | v | Y | G            | L | I            | v            | 1            | 14    |
| 123 | 195 | R | V            | N            | v | V            | Y | G  | L            | I | V | I            | I | s            | А            | I            | 14    |
| 124 | 213 | s | $\mathbf{L}$ | L            | I | S            | F | s  | Y            | L | L | Ι            | L | K            | $\mathbf{T}$ | V            | 14    |
| 125 | 220 | Y | L            | L            | I | L            | K | T  | V            | L | G | L            | Т | R            | E            | Α            | 14    |
| 126 | 221 | L | L            | I            | L | K            | Т | v  | L            | G | L | T            | R | E            | Α            | Q            | 14    |
| 127 | 225 | K | $\mathbf{T}$ | V            | L | G            | L | T  | R            | E | Α | Q            | A | K            | A            | F            | 14    |
| 128 | 259 | L | S            | М            | v | Н            | R | F  | S            | ĸ | R | R            | D | S            | $\mathbf{P}$ | L            | 14    |
| 129 | 270 | D | S            | P            | L | P            | V | I  | L            | Α | N | I            | Y | Ĺ            | L            | V            | 14    |
| 130 | 273 | L | P            | V            | I | L            | A | N  | 1            | Y | L | L            | V | Р            | Р            | V            | 14    |
| 131 | 274 | P | V            | I            | L | Α            | N | I  | Y            | L | L | V            | P | P            | V            | L            | 14    |
| 132 | 280 | I | Y            | L            | L | V            | P | P  | V            | L | N | P            | I | V            | Y            | G            | 14    |
| 133 | 284 | v | P            | P            | v | L            | N | P  | Ι            | v | Y | G            | V | K            | $\mathbf{T}$ | K            | 14    |
| 134 | 302 | Q | R            | Ι            | L | R            | L | F  | Н            | v | Α | Т            | Н | Α            | S            | E            | 14    |

### HLA-DRB1\*1101 15-mers

## (SEQ ID NOS 2806-2866, respectively in order of appearance)

|   | Pos |  | _ | _            | _            |   | _ | _ | _            | _ | _ | _            | _            | _ | _ |              | _            | score |
|---|-----|--|---|--------------|--------------|---|---|---|--------------|---|---|--------------|--------------|---|---|--------------|--------------|-------|
|   |     |  | 1 | 2            | 3            | 4 | 5 | 6 | 7            | 8 | 9 | 0            | 1            | 2 | 3 | 4            | 5            |       |
| 1 | 145 |  | K | Ι            | G            | v | Α | A | V            | V | R | G            | Α            | А | L | M            | A            | 28    |
| 2 | 122 |  | F | Ď            | R            | Y | V | A | I            | C | Н | P            | L            | R | Н | Α            | Т            | 25    |
| 3 | 217 |  | S | F            | s            | Y | L | L | Ι            | L | K | $\mathbf{T}$ | V            | L | G | L            | $\mathbf{T}$ | 25    |
| 4 | 197 |  | N | V            | V            | Y | G | L | 1            | V | I | Ι            | s            | Α | I | G            | ${f L}$      | 24    |
| 5 | 10  |  | S | A            | $\mathbf{T}$ | Y | F | I | $\mathbf{L}$ | 1 | G | L            | P            | G | L | $\mathbf{E}$ | E            | 23    |
| 6 | 255 |  | P | F            | I            | G | L | s | М            | V | H | R            | F            | s | K | R            | R            | 23    |
| 7 | 44  |  | N | $\mathbf{L}$ | $\mathbf{T}$ | I | I | Y | I            | V | R | $\mathbf{T}$ | $\mathbf{E}$ | Н | S | L            | Н            | 22    |
|   | 90  |  |   |              |              |   |   |   |              |   |   |              |              |   |   |              |              |       |

HLA-DRB1\*1101 15-mers
(SEQ ID NOS 2806-2866, respectively
in order of appearance)

| -        | Pos        |        | 2 | 3   | 4      | 5 | 6 | 7      | 8 | 9 | 0   | 1 | 2   | 3   | 4   | 5 | score |
|----------|------------|--------|---|-----|--------|---|---|--------|---|---|-----|---|-----|-----|-----|---|-------|
| ٥        | 59         | 1<br>E | P | M   | 4<br>Y | I | F | ,<br>L | C | M | L   | S | G   | I   | D.  | I | 22    |
| 8<br>9   | 158        | M      | A | P   | L      | P | v | F      | I | ĸ | Q   | L | P   | F   | C   | R | 22    |
|          | 237        | K      | A | F   | G      | T | C | V      | s | Н | V   | C | Ā   | v   | F   | I | 22    |
| 10       | 237<br>74  | L      | I | Ş   | T      | s | s | M      | P | ĸ | М   | L | A   | I   | F   | W | 21    |
| 11       | 134        | Н      | A | T   | v      | L | T | L      | Р | R | V   | Т | K   | Ī   | G   | v | 20    |
| 12       |            |        | L | T   | L      | Р | R | A<br>P | T | K | I   | G | V   | A   | Α   | v | 20    |
| 13       | 137        | V      | Л | F   | I      | K | Q | v<br>L | P | F | C   | R | s   | N   | I   | L | 20    |
| 14       | 162<br>199 | P<br>V | Y | G   | L      | I | v | I      | I | s | A   | I | G   | L   | D   | s | 20    |
| 15       | 224        | L      | K | T   | v      | L | G | L      | Т | R | E   | A | Q   | A   | K   | A | 20    |
| 16<br>17 | 256        | F      | I | G   | L      | S | M | V      | Н | R | F   | S | K   | R   | R   | D | 20    |
|          | 290        | P      | I | V   | Y      | G | v | K      | Т | K | E   | I | R   | Q   | R   | I | 20    |
| 18       | 301        | R      | Q | R   | I      | L | R | L      | F | н | V   | A | Т   | H   | A   | s | 20    |
| 19       | 65         | L      | C | M   | L      | S | G | I      | D | I | L   | I | s   | Т   | s   | s | 19    |
| 20       |            | L      | L | Q   | I      | F | A | I      | Н | s | L   | s | G   | M   | E   | s | 19    |
| 21       | 100        | A P    | И | V   | v      | Y | G | L      | I | v | I   | I | s   | A   | ī   | G | 19    |
| 22       | 196        | F      | S | Y   | v<br>L | L | I | Г      | K | T | V   | L | G   | L   | Т   | R | 19    |
| 23       | 218        | C      | A | V   | F      | I | F | Y      | V | P | F   | I | G   | L   | s   | М | 19    |
| 24       | 247<br>274 | P      | V | I   | L      | A | N | I      | Y | L | L   | v | P   | P   | V   | L | 19    |
| 25       |            | L      | T | I   | I      | Y | I | V      | R | T | E   | Н | s   | L   | Н   | E | 18    |
| 26<br>27 |            | L      | S | G   | I      | D | I | L      | I | S | Т   | s | s   | М   | p   | ĸ | 18    |
|          |            | M      | P | K   | м      | L | A | I      | F | W | F   | N | S   | Т   | T   | I | 18    |
| 28<br>29 |            | D      | A | C   | L      | L | Q | I      | F | A | I   | Н | s   | Ĺ   | s   | G | 18    |
|          | •          | I      | F | A   | I      | Н | S | L      | s | G | М   | E | S   | Т   | v   | L | 18    |
| 30<br>31 |            | A      |   | G   | L      | D | S | L      | L | I | S   | F | s   | Y   | L   | L | 18    |
| 32       |            | v      | F | I   | F      | Y | v | P      | F | I | G   | L | s   | М   | v   | Н | 18    |
|          |            | M      |   | I   | F      | ь | C | М      | L | s | G   | I | D   | I   | L   | I | 17    |
| 33       |            | L      | I | S   | F      | S | Y | L      | L | I | L   | K |     | V   | L   | G | 17    |
| 34<br>35 |            | L      |   |     |        | Н | R | F      | S | K | R   | R | D   | s   | P   | L | 17    |
| 36       |            | A      |   |     | Y      | L | L | V      | P | P | V   | L | N   | P   | I   | v | 17    |
| 37       |            | L      |   |     |        | V | Y | Ğ      | v | ĸ |     | K |     | I   | R   |   | 17    |
| 38       |            | A      |   |     |        | I | L | I      | G | L | P   | G |     | E   | E   | Ā | 16    |
| 39       |            | E      |   |     |        | W | L | A      | F | P | L   |   | s   | L   | Y   |   | 16    |
| 40       |            | L      |   | _   |        |   | ī | I      | Y | I |     |   |     |     |     |   | 16    |
| 41       |            | Y      |   |     |        | I | G |        |   | M |     |   |     |     |     |   | 16    |
| 42       |            | Ī      |   |     |        | v |   |        |   |   |     |   |     |     |     |   | 15    |
| 43       |            | Ċ      |   |     |        |   | F |        |   | н |     |   |     |     |     |   | 15    |
| 44       |            | v      |   |     |        |   |   |        | D |   |     |   |     |     |     |   | 15    |
| 4.5      |            | v      |   |     |        |   |   |        |   |   |     |   |     |     |     | L | 15    |
| 46       |            | S      |   |     |        |   |   |        |   |   | К   | L | A   | C   | D   | D | 15    |
| 47       |            |        |   |     |        | T | _ | E      |   |   |     |   | . A | F   | G   | T | 15    |
| 48       |            | 2      |   |     |        |   |   |        |   | - |     |   |     |     |     |   | 15    |
| 49       |            | M      |   |     |        |   |   |        |   |   |     |   |     |     |     |   | 15    |
| 50       |            | I      |   |     |        |   |   |        |   |   |     |   |     |     |     |   | 15    |
| 53       |            | E      |   |     |        |   |   |        |   | Y |     |   |     |     | ' K | Ε | 15    |
| 52       |            | 5      |   |     |        |   |   |        |   |   |     |   |     |     |     |   | 14    |
| 53       |            | 3      |   |     |        |   |   |        |   |   |     |   |     |     |     |   | 14    |
| 54       |            | 7      |   |     |        |   |   |        |   |   |     |   |     |     |     |   |       |
| 5:       |            | I      |   |     |        |   |   |        |   |   |     |   |     | 7 V |     |   |       |
| 56       |            | I      |   |     |        |   |   |        |   |   | . 5 |   |     |     | , F |   |       |
| ٠.       |            | _      |   | - • | _      | _ | _ |        |   |   | _   |   |     |     | 91  |   |       |
|          |            |        |   |     |        |   |   |        |   |   |     |   |     |     |     |   |       |

# HLA-DRB1\*1101 15-mers (SEQ ID NOS 2806-2866, respectively in order of appearance)

|    | Pos |    |   |   |   |   |   |   |   |   |              |   |   |   |   |   | score |
|----|-----|----|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|-------|
|    |     | 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0            | 1 | 2 | 3 | 4 | 5 |       |
| 57 | 180 | Y  | C | L | H | Q | D | V | М | ĸ | $\mathbf{L}$ | Α | C | D | D | Ι | 14    |
| 58 | 193 | D  | I | R | v | N | v | V | Y | G | L            | Ι | V | I | Ι | S | 14    |
| 59 | 229 | G  | L | Т | R | E | A | Q | Α | ĸ | Α            | F | G | T | С | V | 14    |
| 60 | 270 | D  | S | P | L | P | v | I | L | A | И            | 1 | Y | L | L | V | 14    |
| 61 | 298 | K  | E | I | R | Q | R | I | L | R | $\mathbf{L}$ | F | Η | V | Α | Т | 14    |

Table XXIX, beginning at page 213, line 1, has been amended as follows:

## Table XXIX. Nucleotide sequence in the 5' region close to 101P3A11 gene (SEQ ID NO: 2867).

| <i>!</i> • |             |                    |                    |             |              |            |
|------------|-------------|--------------------|--------------------|-------------|--------------|------------|
|            | 1 TGCGCTCCA | C CAAGCCTGG        | C TAACTTTTG        | C ATTTTTAAT | A GAGGCAGGG' | TTCACCATGT |
|            | TGGCCTGGCT  |                    |                    |             |              |            |
| 121        | CTGGGATTAC  | AGGCGTGAGC         | CACTGTACCT         | GGCGGGGCTT  | ATTGTTTTTT   | AAAAAGATTT |
| 181        | CCAAAACCTT  | GCCCTGGCAA         | TTCTGATTTT         | CTGGGCCTGG  | AGCAGGACCT   | GGAGGGATGG |
|            | TGTTGTCAAT  |                    |                    |             |              |            |
|            | AACACAAACC  |                    |                    |             |              |            |
|            | GATTATAGTA  |                    |                    |             |              |            |
|            | CCCTAACCCC  |                    |                    |             |              |            |
| 481        | AAGTCTACTC  | TGATGGGAAA         | AGGCTAAGAG         | CAGTGCCCTG  | GGCAGCAACA   | TCAGCTCTGA |
| 541        | AGATGCAGGA  | CTGTGTTACA         | ${\tt TGTTTTATGA}$ | GTGGGTCTTC  | ACACACTGAG   | ATTCATGGGA |
|            | CAGTAATAGA  |                    |                    |             |              |            |
| 661        | TGTCCAGGAA  | GTTGTATATA         | AGGAGAATCA         | GAGCAGAGAG  | AGACTAGGGT   | TCAGAATTAC |
| 721        | CAGGATGACT  | ${\tt TAGTCCTGTT}$ | TGTTACTGTC         | ACCACTCCAA  | TGCCTTTTCC   | TCATTAGTCC |
| 781        | TTTCTCTCCT  | CTGAGCCACA         | ACTAAATGAT         | GTTTCTACTT  | TTCCCTTTCT   | ACTTTCCTAG |
| 841        | ACCCTGGATT  | TTGTATGCAG         | AAGCCCCAGC         | TCTTGGTCCC  | TATCATAGCC   | ACTTCAAATG |
| 901        | GAAATCTGGT  | CCACGCAGCA         | TACTTCCTTT         | TGGTGGGTAT  | CCCTGGCCTG   | GGGCCTACCA |
|            | TACACTTTTG  |                    |                    |             |              |            |
|            | TGACCATTGT  |                    |                    |             |              |            |
|            | TGGCCATGCT  |                    |                    |             |              |            |
|            | GTCTTTTCCT  |                    |                    |             |              |            |
|            | TTATCCATGC  |                    |                    |             |              |            |
|            | TTGTGGCCAT  |                    |                    |             |              |            |
|            | AGATTGGACT  |                    |                    |             |              |            |
| 1381       | TCAAGTGGTT  | GTCCTACTGC         | CAAACACATA         | CTGTCACACA  | CTCCTTCTGT   | CTGCACCAAG |
| 1441       | ATATTATGAA  | GCTGTCCTGT         | ACTGACACCA         | GGGTCAATGT  | GGTTTATGGA   | CTCTTCATCA |
| 1501       | TCCTCTCAGT  | CATGGGTGTG         | GACTCTCTCT         | TCATTGGCTT  | CTCATATATC   | CTCATCCTGT |
| 1561       | GGGCTGTTTT  | GGAGCTGTCC         | TCTCGGAGGG         | CAGCACTCAA  | GGCTTTCAAC   | ACCTGCATCT |
| 1621       | CCCACCTCTG  | TGCTGTTCTG         | GTCTTCTATG         | TACCCCTCAT  | TGGGCTCTCG   | GTGGTGCATA |
| 1681       | GGCTGGGTGG  | TCCCACCTCC         | CTCCTCCATG         | TGGTTATGGC  | TAATACCTAC   | TTGCTGCTAC |
| 1741       | CACCTGTAGT  | CAACCCCCTT         | GTCTATGGAG         | CCAAGACCAA  | AGAGATCTGT   | TCAAGGGTCC |
|            | TCTGTATGTT  |                    |                    |             |              |            |
| 1861       | ACAGAAGATG  | GGAATATTAG         | GATCCTATTG         | AATGCCTTGG  | TGATTAAAGT   | ATCAAACCTA |
| 1921       | TTGTGCTGTC  | TTCTTCCAGC         | AATTTAAGTA         | GATCATGTAT  | TCTGTCTCCA   | GGAATGTGTC |
| 1981       | AGTACTGAAC  | TTATGACCCT         | GTCTGGACAT         | CCTGGAGAAT  | GACTGCACTA   | GTCCCTCTGC |
|            | TATGGTGGTC  |                    |                    |             |              |            |
| 2101       | GGAGGCTGTA  | AAGATCACAC         | CTCATGGTTC         | ATTCCAGTTT  | TGAAGTATGA   | TTTTAATGTT |

| 2161 | CTTGCCCCCA         | TGTGCCCATG | TTGGTGAATT         | TGCATGGACT | ATAAACGTTA         | TTGCAAATAC |
|------|--------------------|------------|--------------------|------------|--------------------|------------|
| 2221 | CCTAAAGTGG         | TTACCCAGCC | ATAATCAGGG         | GTTAATGAAG | GTATTTGGGG         | AATAGTAACT |
| 2281 | GGAGAGACAG         | CAACAAGACA | AGAGGCAGCT         | CACATGCAAT | GTTGAAGTTT         | CTGTATGCAA |
| 2341 | GAGGGTGTGT         | TGGCAGATTT | GTGAAATCTG         | CCCATTTGCA | TCTGTATGGC         | TCTATATGAC |
| 2401 | TATTTGTCCA         | TAAGGGTGCC | ATGTATTCTG         | GTTGTGGGTG | TGAATGTGTG         | GGTGTGTTTA |
| 2461 | TGTGGACACT         | TGCTTTTCAG | TGTGCGTATA         | TGTGAGAGAG | AGGGTGCACA         | CATGGAATAC |
| 2521 | GTACTGGTTG         | TGTCCTGGTG | AGTGTGGTAG         | CTATGTCCTG | GCACATGTAT         | GTTTCATGAG |
| 2581 | ACGTGTCTCT         | GATTGCGCAT | TTGTATTTCT         | GTGGTATCTG | TTAGTTGGTA         | TATGATATGT |
| 2641 | GTCTACGTGA         | GAATGCTGGT | GTCTGTATCT         | GCATGGTGGG | CAGTACCTTT         | ATGTGTATCT |
| 2701 | GGTAAGAATG         | CTGCCTCTAC | CTTTTCTTCC         | TATTTGTACT | ATGTGAATGT         | GGTGCATGAA |
| 2761 | TGTGTGGAAT         | GTGTGGAATG | TGTAGTATTG         | GGATGCCTGT | ATCTTTCAGC         | GTGTTTGGGT |
| 2821 | GTATGTCCAC         | TGTGCATAAT | ATTTGAGATG         | TAAAACCATT | ${\tt TTGTGCGGTA}$ | TATGTGTTAT |
| 2881 | TAGTTGTAAG         | TCGGTGAAAT | GTACATCTGA         | ATTCTGTGTG | CATATTGTTG         | GTACTGATGC |
| 2941 | TATTTTCGTG         | CATATGTCTA | GTGTATATGT         | TTTAAGGCAA | ACTTTCTTTG         | TGTGTTGGGT |
| 3001 | GTGTATGTGA         | CACGAATGGG | GACAGCATCT         | GTATTTCTGA | GCATGGATTG         | ATGTGTGGTG |
| 3061 | TCTGTATGTA         | TCTTGGAATG | GAGGAGGAG          | ATTGAAGAAG | TCTGGCTGTG         | AGCAGCAGAA |
| 3121 | ATAATTTCCA         | AAGTTGAGTG | ACATGACTCT         | AAGATGCCCA | GTTTCTCGGC         | CTGGGGTCAG |
| 3181 | CCTGGGTGAT         | AGCTCAGTCT | GTCAGAATGA         | AAGGAAACAC | GGTGCTTCCT         | TGCTCCACCT |
| 3241 | TTTCACAGGC         | CAGACCACAC | CTTCTTCATC         | CTGAACACAA | GGATTTCAAG         | GGCTTTTGTT |
|      | ACCTCTTCCT         |            |                    |            |                    |            |
|      | TCCTGCCTCA         |            |                    |            |                    |            |
| 3421 | CCAAACATGT         | ATAAAAGTCC | TTGGTTCCCC         | ATCTCTACTA | <b>AAAATACAA</b> C | AATTAGCCGG |
|      | GTGTGATGGC         |            |                    |            |                    |            |
|      | GAGCCCGCAA         |            |                    |            |                    |            |
| 3601 | ACAGAGCAAG         | ACTCTGTGTC | AAAAAAAAA          | AAAAAAAAA  | AGCCTTGGTT         | GTAGGGAGTT |
|      | TCTCCTAATC         |            |                    |            |                    |            |
|      | GCCGCATGGA         |            |                    |            |                    |            |
|      | TCACCTTGTC         |            |                    |            |                    |            |
|      | GAAGTAGAAG         |            |                    |            |                    |            |
|      | ATGGAGGCAG         |            |                    |            |                    |            |
|      | AGGCACCAGA         |            |                    |            |                    |            |
|      | TTGCCATGAT         |            |                    |            |                    |            |
|      | CACAGTTGTG         |            |                    |            |                    |            |
|      | <u>TA</u> TTTATAGA |            |                    |            |                    |            |
|      | TTGTTCTCTA         |            |                    |            |                    |            |
|      | TGTCATTGGT         |            |                    |            |                    |            |
|      | TGTCCTCAGC         |            |                    |            |                    |            |
|      | CTGGGGACCT         |            |                    |            |                    |            |
|      | GATGTAGCCC         |            |                    |            |                    |            |
|      | GGACCTAAAC         |            |                    |            |                    |            |
|      | AAATGGGCTG         |            |                    |            |                    |            |
|      | TGAGTTTGAT         |            |                    |            |                    |            |
|      | AGTTTCTTCT         |            |                    |            |                    |            |
|      | ATGAGGATCC         |            |                    |            |                    |            |
|      | CCTCCCCATA         |            |                    |            |                    |            |
|      | CACAGTGGGC         |            |                    |            |                    |            |
|      | CTGCAGGAAG         |            |                    |            |                    |            |
| 4981 | GAGGTCCAAG         | GGAGTAGGCG | <b>GAG</b> Acagaga | ggctgtattt | cagtgcagcc         | tgccagacct |
|      |                    |            |                    |            |                    |            |

Note: The three high score predictions of promoters were bold and underlined. The lower case sequence indicates the beginning part of the transcript of 101P3A11 gene.

Table XXX, beginning at page 214, line 35, has been amended as follows

ï

Table XXX: Promoters and their positions predicted by Neural Network Promoter Prediction computer program (various portions of SEQ ID NO: 2867, respectively, in order of appearance).

| Start | End  | Score | Promoter Sequence                                  |
|-------|------|-------|--|
| 25    | 75   | 0.91  | TTTTGCATTTTTAATAGAGGCAGGGTTTCACCATGTTGGCCTGGCTGG   |
| 665   | 715  | 0.95  | CAGGAAGTTGTATATAAGGAGAATCAGAGCAGAGAGAGACTAGGGTTCAG |
| 2477  | 2527 | 0.91  | TCAGTGTGCGTATATGTGAGAGAGAGGGTGCACACATGGAATACGTACTG |
| 3139  | 3189 | 0.82  | TGACATGACTCTAAGATGCCCAGTTTCTCGGCCTGGGGTCAGCCTGGGTG |
| 3420  | 3470 | 0.96  | GCCAAACATGTATAAAAGTCCTTGGTTCCCCATCTCTACTAAAAATACAA |
| 4092  | 4142 | 0.99  | AACTGATCAGTAAAAAATAAGGGGAGACCAACTAAAAACCATGTTGTTCT |
| 4953  | 5003 | 0.97  | AGGCAGAGAATAAATAACCCTGACCAGGGAGGTCCAAGGGAGTAGGCGGA |

Table XXXI, beginning at page 215, line 1, has been amended as follows:

Table XXXI: Alignment of five homologous 5' upstream genomic regulatory regions of the human 101P3A11 and PSA genes.

Query: 5' upstream regulatory region of the PSA gene Subject: Putative 5' upstream regulatory region of the 101P3A11 gene. Nucleic acid sequences predicted to be binding sites for the

Nucleic acid sequences predicted to be binding sites for the indicated transcription factors are **bolded**, <u>underlined</u>, or *italicized*.

| 1. NF-1 SP-1 NF-1 Query: 3864 ccaggctggagtgcagtggcgcagtctcggctcactgcaacctctgcctccaggttcaa 3923 (SEQ ID NO: 2868)   |  |
|--|--|
| Query: 3924 gtgattctcctgcctcagcctcctgagttgctgggattacaggcatgcagcaccatgccc 3983                                      |  |
| Query: 3984 agctaatttttgtatttttagtagagatgggg 4015  |  |
| 2. Query: 4670 cctgtaatcccagctactgaggaggctgaggcaggagaatcacttgaacccagaaggcag 4729 (SEQ ID NO: 2870)                 |  |
| (SEQ ID NO: 2871)  SP1 NF-1 NF-1 GR  Query: 4730 aggttgcaatgagccgagattgcgccactgcactccagcctgggtgacagagtgagactc 4789 |  |
| Sbjct: 3556 aggttgcagtgagccgagatcatgccactgcactccagcct-ggtgacagagcaagactc 3614  Query: 4790 tgtctcaaaaaaaaaaaa 4807 |  |

۱,

| 3.                         |  |      |
|----------------------------|--|------|
| Query: 142                 | GR NF-1 SP1 tgagactgagtctcgctctgtgcccaggctggagtgcagtggtgcaaccttggctcactg | 201  |
| (SEQ ID NO:                | <u>2872)</u><br>   |      |
| Sbjct: 3621<br>(SEQ ID NO: | tgacacagagtcttgctctgtcaccaggctggagtgcagtggcatgatctcggctcactg             | 3562 |
| Query: 202                 | caagctccgcctcctgggttcacgccattctcctgcctcagcctcctgagtagctgggac             | 261  |
| Sbjct: 3561                |  | 3502 |
|                            | NF-1   |      |
| Query: 262                 | tacaggcacccgccaccacgcctggctaannnnnngtatttttagtagagatgggg 318             |      |
| Sbjct: 3501                | tacaggcacgcgccatcacacccggctaattgttgtatttttagtagagatgggg 344              | 7    |
|                            |  |      |
| 4.<br>Query: 300 a         | atttttagtagagatggggtttcactgtgttagccaggatggtctcagtctcctgacctc 3           | 59   |
| (SEQ ID NO:                |  |      |
|                            | atttttaatagaggcagggtttcaccatgttggcctggctgg                               | 0    |
| (DDQ ID NO.                | SP1<br>LF-A1 CP2   |      |
|                            | gtgatctgccaccttggcctcccaaagtgctgggattacaggcgtga <b>gccact</b> gcgcct 4   | 19   |
|                            |  | 50   |
| N                          | F-1  |      |
| Query: 420 g               | ggc 422<br>  |      |
| Sbjct: 151                 | • • •  |      |
|                            |  |      |
| _                          |  |      |
| 5.                         | NF - 1   |      |
| Ouerv: 4506                | NF-1 CP2 gccaggcacagtggctcacgcctgtaatcccaacaccatgggaggctgagatgggtggat    | 4565 |
| (SEQ ID NO:                |  |      |
| Sbjct: 153<br>(SEQ ID NO:  | gccaggtacagtggctcacgcctgtaatcccagcactttgggaggccgaggtgggcagat             | 94   |
| Query: 4566                | cacgaggtcaggagtttgagaccagcctgaccaacatggtgaaactctgtctcta 4620             |      |
| Sbjct: 93                  | cgcaaggtcagggttcgagaccagccaacatggtgaaaccctgcctcta 39                     |      |

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### Figure 1 (SEQ ID NO:2878)

FIG. 2A (SEQ ID NOS:2879 & 2880)

|     |        |     |            |     |       |            |        |       |     | •   |     |     |       |       |     |            |       |            |
|-----|--------|-----|------------|-----|-------|------------|--------|-------|-----|-----|-----|-----|-------|-------|-----|------------|-------|------------|
|     |        |     | 9          |     |       | 18         |        |       |     |     |     |     |       |       |     |            |       |            |
| י 5 |        |     |            |     |       | TCA        |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     | 63         |     |       | 72         |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     |            |     |       | CAT        |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     |            |     |       |            |        |       | -   |     |     |     |       |       | 153 |            |       | 162        |
|     |        |     |            |     |       | TTC        |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            | <br>s |            |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     | 171        |     | . m.a |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     | GCT    | ACA | TAC        | TTC |       | CTA        |        |       |     |     |     |     | GAA   |       |     |            |       |            |
|     | A      | T   | Y          | F   | I     | L          | I      | G     | L   | P   | G   | L   | E     | E     | A   | Q          | F     | W          |
|     |        |     | 205        |     |       | 224        |        |       | 242 |     |     | 252 |       |       | 261 |            |       | 270        |
|     | TTG    | GCC | 225<br>TTC | CCA | TTG   | TGC        |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     | L      | A   | F          | P   | L     | C          | S      | L     | Y   | L   | I   | A   | v     | L     | G   | И          | L     | T          |
|     |        |     | 279        |     |       | 288        |        |       | 297 |     |     | 306 |       |       | 315 |            |       | 324        |
|     | ATC    | ATC |            |     |       | CGG        |        |       |     |     |     |     |       |       |     |            |       |            |
|     |        |     | ( )        |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     | I      | I   | Y          | I   | V     | R          | T      | E     | н   | S   | L   | н   | E     | Ъ     | М   | ¥          | 1     | F          |
|     |        |     | 333        |     |       | 342        |        |       | 351 |     |     | 360 |       |       | 369 |            |       | 378        |
|     | CTT    | TGC | ATG        | CTT | TCA   | GGC        |        |       |     | CTC | ATC | TCC | ACC   | TCA   | TCC | ATG        | CCC   | AAA        |
|     | <br>T. |     |            | T.  |       | <br>G      |        |       |     | T.  | т   |     | <br>T | 5     | s   | M          | <br>p |            |
|     | -      | _   | 2.2        | _   | _     | J          | -      | _     | -   | -   | _   | _   | •     | _     | _   |            | -     |            |
|     |        |     | 387        |     |       |            |        |       |     |     |     |     |       |       |     |            |       | 432        |
|     | ATG    |     | GCC        | ATC |       | TGG        |        |       |     |     |     |     |       |       |     | GCT        |       | CTG        |
|     |        |     | A          | I   |       | W          |        |       |     |     |     |     |       |       | D   | A          | C     | L          |
|     |        |     |            |     |       |            |        | ٠.    |     |     |     |     |       |       |     |            |       |            |
|     | ርጥአ    | CNG | 441        | առա | acc   | 450<br>ATC |        | TCC   |     |     |     |     |       |       | 477 |            | CTG   | 486<br>CTG |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     | L      | Q   | I          | P   | A     | I          | H      | S     | L   | S   | G   | M   | B     | s     | T   | . <b>v</b> | L     | L          |
|     |        |     | 495        |     |       | 504        |        |       | 513 |     |     | 522 |       |       | 531 |            |       | 540        |
|     | GCC    | ATG |            | TTT | GAC   | CGC        |        |       |     |     |     |     |       | CTG   |     |            |       |            |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       |       |     |            |       |            |
|     | A      | M   | A          | F   | D     | R          | Y      | v     | A   | I   | С   | н   | P     | L     | R   | н          | A     | · T        |
|     |        |     | 549        |     |       | 558        |        |       | 567 |     |     | 576 |       |       | 585 |            |       | 594        |
|     | GTA    | CTT | ACG        | TTG | CCT   | CGT        | GTC    | ACC   | AAA | ATT | GGT | GTG | GCT   | GCT   | GTG | GTG        | CGG   | GGG        |
|     |        |     |            |     |       |            |        |       |     |     |     |     |       | <br>A | v   | v          | <br>R | <br>G      |
|     | V      | L   | T          | L   | P     | R          | V      | T     | K.  | I   | G   | ٧   | A     | A     | ٧   | •          | ĸ     | u          |
|     |        |     | 603        |     |       | 612        |        |       | 621 |     |     | 630 |       |       | 639 |            |       | 648        |
|     |        |     |            | ATG |       | CCC        | CTT    |       |     |     | ATC | AAG | CAG   | CTG   | CCC |            |       |            |
|     |        |     |            | т.  |       | <br>P      | <br>I. | <br>P |     | F   |     | ĸ   | 0     | L     | P   | F          | c     | R          |
|     | ••     |     | _          |     |       | -          |        | -     | -   |     | _   |     | -     |       |     |            |       |            |

FIG. 2B

|  |             | 657   |                 |               | 666  |                   |              | 675                                  | ٠,                  |  | 684  |                          |                      | 693   |                             |   | 702   |
|--|-------------|---|-----------------|---------------|--|-------------------|--------------|--------------------------------------|---------------------|--|--|--------------------------|----------------------|---|-----------------------------|---|---|
| TCC                                    | <b>א</b> ממ | ATC   | СТТ             | TCC           | CAT  | TCC               | TAC          | TGC                                  | CTA                 | CAC                                    | CAA  | GAT                      | GTC                  | ATG   | AAG                         | CTG                                     | GCC   |
|  |             |   |                 |               |  |                   |              |                                      |                     |  |  |                          |                      |   |                             |   |   |
| s                                      | N           | I   | L               | s             | н  | s                 | Y            | C                                    | L                   | н                                      | Q  | D                        | v                    | M   | ĸ                           | L                                       | A   |
| Ð                                      | 14          | _   |                 |               |  | _                 | -            | _                                    |                     |  | _  |                          |                      |   |                             |   |   |
|  |             | 711   |                 |               | 720  |                   |              | 729                                  |                     |  | 738  |                          |                      | 747   |                             |   | 756   |
| mam                                    | a m         | GAT   | 3 m/C           | ccc           |  | א א מי            | CTC          | GTC                                  | TAT                 | GGC                                    |  | ATC                      | GTC                  | ATC   | ATC                         | TCC                                     | GCC   |
| TGT                                    | GAT         | GAI   | AIC             | CGG           | GIC  |                   |              |                                      |                     |  |  |                          |                      |   |                             |   |   |
|  |             |   |                 |               | 37   | NT.               | 17           | v                                    | v                   | G                                      | т.   | I.                       | v                    | I   | I                           | S                                       | A   |
| C                                      | D           | D   | I               | K             | ٧  | 14                | •            | •                                    | -                   | •                                      | ~  |                          | -                    | _   | _                           | _                                       |   |
|  |             | 765   |                 |               | 774  |                   |              | 783                                  |                     |  | 792  |                          |                      | 801   |                             |   | 810   |
|  |             | 765<br>CTG  | a. a            | maa.          | 773  | CTC C             | איזיכי       | TCC                                  | TTC                 | TCA                                    |  | CŤG                      | CTT                  |   | CTT                         | AAG                                     | ACT   |
| ATT                                    | GGC         | CTG   | GAC             | TCA           | CII  | CIC               | AIC          |                                      |                     |  |  |                          |                      |   |                             |   |   |
|  |             | L   |                 |               |  | 7                 | т            | s                                    | R                   | S                                      | v  | L                        | L                    | I   | L                           | ĸ                                       | T   |
| I                                      | G           | 1.  | ע               | 5             | ш  | ш                 | _            | 5                                    | -                   | _                                      | -  | _                        | _                    |   |                             |   | _   |
|  |             | 010   |                 |               | 828  |                   |              | 837                                  |                     |  | 846  |                          |                      | 855   |                             |   | 864   |
|  |             | 819<br>GGC  |                 |               | 040  | <b>a</b>          | 000          |                                      | acc                 | 220                                    |  | ጥጥጥ                      | GGC                  |   | TGC                         | GTC                                     |   |
| GTG                                    | TTG         | GGC   | TTG             | ACA           | CGI  | GAA               |              |                                      |                     |  |  |                          |                      |   |                             |   |   |
|  |             |   |                 |               |  | B                 | A            |                                      | A                   | ĸ                                      | A  | F                        | G                    | т   | C                           | v                                       | s   |
| v                                      | L           | G   | L               | T             | R  | 4                 | A            | Q                                    | ^                   |  | -  | -                        | J                    | -   | _                           | -                                       | _   |
|  |             |   |                 |               |  |                   |              | 891                                  |                     |  | 900  |                          |                      | 909   |                             |   | 918   |
|  |             | 873<br>TGT  |                 |               | 882  |                   |              | D 3 T                                | CE N                | c) Carr                                |  | אידיי                    | CCA                  |   |                             | ATG                                     |   |
| CAT                                    | GTG         | TGT   | GCT             | GTG           | TTC  | ATA               | TIC          | IMI                                  | GIA                 |  |  |                          |                      |   |                             |   |   |
|  |             |   |                 |               |  |                   |              |                                      | v                   | p                                      | F  | ı                        | G                    | L   | S                           | M                                       | v   |
| H                                      | V           | С   | A               | v             | F  | I                 | F            | Y                                    | ٧                   | P                                      | F  | _                        | G                    |   | 5                           | 2.7                                     | •   |
|  |             |   |                 |               |  |                   |              | 0.45                                 |                     |  | 954  |                          |                      | 963   |                             |   | 972   |
|  |             | 927   |                 |               | 936  |                   |              | 945                                  |                     |  |  |                          | N TO CO              |   |                             | እስጥ                                     |   |
| CAT                                    | CGC         | TTT   | AGC             | AAG           | CGG  | CGT               | GAC          |                                      | CCG                 | CTG                                    | CCC  | GTC                      | ATC                  | 116   | GCC                         | WWI                                     | AIC   |
|  |             |   |                 |               |  |                   |              |                                      |                     |  |  |                          |                      |   |                             | N                                       | I   |
| H                                      | R           | F   | S               | K             | R  | R                 | D            | S                                    | P                   | L                                      | P  | v                        | I                    | L   | A                           | 14                                      | _   |
|  |             |   |                 |               |  |                   |              |                                      |                     |  |  |                          |                      |   |                             |   |   |
|  |             |   |                 |               |  |                   |              |                                      |                     |  |  |                          |                      |   |                             |   |   |
|  |             | 981   |                 |               | 990  |                   |              | 999                                  |                     |  | 1008   |                          |                      | 1017  |                             |   | 1026  |
| TÄT                                    | CTG         | 981<br>CTG  | GTT             | CCT           | 990<br>CCT   | GTG               | CTC          | AAC                                  |                     |  |  |                          |                      |   |                             | ACA                                     | AAG   |
| TÄT                                    | CTG         | 981<br>CTG  | GTT             |               | CCT  |                   |              | AAC                                  | CCA                 | ATT                                    | GTC  | TAT                      | GGA                  | GTG   | AAG                         | ACA                                     | AAG   |
| TÄT<br><br>Y                           |             | 981<br>CTG<br><br>L   | GTT             | CCT<br>       | 990<br>CCT<br><br>P  |                   | CTC<br><br>L | AAC                                  | CCA                 | ATT                                    |  | TAT                      | GGA                  |   | AAG                         | ACA                                     | AAG   |
|  |             | CTG   | GTT             | <br>P         | CCT<br>P   | <br>v             |              | AAC<br>N                             | CCA<br><br>P        | ATT                                    | GTC<br><br>V   | TAT<br><br>Y             | GGA<br><br>G         | GTG<br><br>V  | AAG<br><br>K                | ACA<br>T                                | AAG<br><br>K  |
| Y                                      | L           | CTG<br>L  | GTT<br><br>V    | P             | CCT<br>P<br>1044   | v                 | L            | AAC<br>N<br>1053                     | CCA<br>P            | ATT                                    | GTC<br><br>V<br>1062                                 | TAT                      | GGA<br><br>G         | GTG<br><br>V<br>1071                                | AAG<br><br>K                | ACA<br>T                                | AAG<br><br>K<br>1080                                      |
| Y                                      | L           | CTG<br>L  | GTT<br><br>V    | P             | CCT<br>P<br>1044   | v                 | L            | AAC<br>N<br>1053                     | CCA<br>P            | ATT                                    | GTC<br><br>V<br>1062                                 | TAT                      | GGA<br><br>G         | GTG<br><br>V<br>1071                                | AAG<br><br>K                | TCA                                     | AAG<br>K<br>K<br>1080<br>GAG                              |
| Y                                      | L           | CTG<br>L  | GTT<br><br>V    | P             | CCT<br>P<br>1044   | v                 | L            | N<br>1053                            | P TTC               | ATT                                    | GTC<br>V<br>1062<br>GTG                              | TAT Y GCC                | GGA<br>G<br>ACA      | GTG<br><br>V<br>1071<br>CAC                         | AAG<br>K<br>GCT             | TCA                                     | AAG<br><br>K<br>1080<br>GAG                               |
| Y                                      | L           | CTG<br>L  | GTT<br><br>V    | P             | P<br>1044<br>ATC   | V                 | L            | AAC<br>N<br>1053                     | P TTC               | ATT                                    | GTC<br>V<br>1062<br>GTG                              | TAT Y GCC                | GGA<br><br>G         | GTG<br><br>V<br>1071<br>CAC                         | AAG<br>K<br>GCT             | TCA                                     | AAG<br>K<br>K<br>1080<br>GAG                              |
| Y<br>GAG                               | L           | L<br>1035   | GTT<br>V<br>CAG | P             | P<br>1044<br>ATC   | V                 | CGA          | AAC<br>N<br>1053<br>CTT              | CCA<br>P<br>TTC     | ATT I CAT                              | GTC<br>V<br>1062<br>GTG<br>V                         | TAT Y GCC                | GGA<br>G<br>ACA      | GTG<br>V<br>1071<br>CAC                             | AAG<br>K<br>GCT             | TCA                                     | AAG<br>K<br>1080<br>GAG<br>                               |
| Y<br>GAG                               | L<br>ATT    | CTG<br>L<br>1035<br>CGA<br>R  | GTT<br>V<br>CAG | P<br>CGC<br>R | CCT P 1044 ATC I   | V<br>CTT          | CGA          | AAC<br><br>N<br>1053<br>CTT<br><br>L | CCA P TTC           | ATT I CAT                              | GTC V 1062 GTG V 1116                                | TAT Y GCC                | GGA<br>G<br>ACA      | GTG<br><br>V<br>1071<br>CAC<br><br>H                | AAG<br>K<br>GCT             | ACA<br>T<br>TCA                         | AAG<br><br>K<br>1080<br>GAG<br><br>E                      |
| GAG                                    | L ATT       | CTG L 1035 CGA R 1089   | GTT V CAG       | P CGC         | CCT P 1044 ATC I 1098  | V CTT             | L CGA        | AAC N 1053 CTT L 1107                | CCA P TTC           | ATT I CAT H                            | GTC V 1062 GTG V 1116                                | TAT Y GCC A              | GGA<br>G<br>ACA<br>T | GTG V 1071 CAC H 1125                               | AAG K GCT A                 | TCA                                     | AAG<br>K<br>1080<br>GAG<br>                               |
| GAG                                    | L ATT       | CTG<br>L<br>1035<br>CGA<br>R  | GTT V CAG       | P CGC         | CCT P 1044 ATC I 1098  | V CTT             | L CGA        | AAC N 1053 CTT L 1107                | CCA P TTC           | ATT I CAT H                            | GTC V 1062 GTG V 1116                                | TAT Y GCC A              | GGA<br>G<br>ACA<br>T | GTG V 1071 CAC H 1125                               | AAG K GCT A                 | TCA                                     | AAG<br><br>K<br>1080<br>GAG<br><br>E                      |
| GAG                                    | L ATT       | CTG L 1035 CGA R 1089   | GTT V CAG       | P CGC         | CCT P 1044 ATC I 1098  | V CTT             | CGA          | AAC N 1053 CTT L 1107                | CCA P TTC           | ATT I CAT H                            | GTC V 1062 GTG V 1116                                | TAT Y GCC A              | GGA<br>G<br>ACA<br>T | GTG V 1071 CAC H 1125                               | AAG K GCT A                 | TCA                                     | AAG<br><br>K<br>1080<br>GAG<br><br>E                      |
| GAG                                    | L           | CTG L 1035 CGA R 1089   | GTT V CAG       | P CGC         | 1044<br>ATC  | V CTT             | L CGA        | AAC N 1053 CTT L 1107 CTT            | CCA P TTC           | CAT H CAT                              | GTC<br>V<br>1062<br>GTG<br><br>V<br>1116             | GCC                      | GGA<br>G<br>ACA<br>T | GTG<br>V<br>1071<br>CAC<br><br>H<br>1125            | AAG<br>K<br>GCT<br>A<br>GAT | TCA                                     | AAG K 1080 GAG E 1134 GAT                                 |
| GAG                                    | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089                                       | GTT V CAG       | P CGC         | CCT P 1044 ATC I 1098 ATC                                      | V CTT             | CGA          | AAC N 1053 CTT L 1107 CTT            | TTC                 | CAT                                    | GTC V 1062 GTG V 1116 TCA                            | GCC                      | GGA G ACA T TCC      | GTG V 1071 CAC H 1125                               | AAG<br>K<br>GCT<br>A<br>GAT | TCA                                     | AAG K 1080 GAG E 1134 GAT                                 |
| GAG                                    | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089                                       | GTT V CAG       | P CGC         | CCT P 1044 ATC I 1098 ATC 1152                                 | V CTT             | CGA          | AAC N 1053 CTT L 1107 CTT            | CCA P TTC F TTC     | CAT H CAT                              | GTC V 1062 GTG V 1116 TCA                            | GCC A GAG                | GGA G ACA T TCC      | GTG V 1071 CAC H 1125 TCT                           | AAG  GCT  A  GAT            | TCA TCA TCA TA                          | AAG K 1080 GAG E 1134 GAT                                 |
| GAG                                    | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG                                       | CAG             | P CGC         | 1044<br>ATC<br><br>I<br>1098<br>ATC<br>                        | V CTT             | CGA          | AAC N 1053 CTT L 1107 CTT            | TTC                 | CAT                                    | GTC V 1062 GTG V 1116 TCA                            | GCC A GAG                | GGA G ACA T T CC     | 1179  | AAG  GCT  A  GAT            | TCA<br>S<br>TCA                         | AAG K 1080 GAG E 1134 GAT 1188                            |
| GAG                                    | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089<br>GTG                                | CAG             | P CGC         | 1044<br>ATC<br><br>I<br>1098<br>ATC<br>                        | V CTT             | CGA          | 1161<br>1161<br>1161                 | TTC                 | CAT                                    | GTC V 1116 TCA 1170 AAA                              | GCC A GAG                | GGA G ACA T T AAT    | GTG V 1071 CAC H 1125 TCT 1179                      | AAG  K  GCT  A  GAT         | TCA<br>S<br>TCA                         | AAG K 1080 GAG E 1134 GAT 1188 AAA                        |
| GAG E CCC                              | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG                                       | CAG Q TCA       | P CGC R GTG   | 1044<br>ATC<br>I<br>1098<br>ATC<br>                            | CTT L AAA         | CGA          | 1161<br>1215                         | TTC                 | CAT CAT                                | GTC V 1116 TCA 1170 AAA                              | GCC A GAG                | GGA                  | 1071<br>CAC<br><br>H<br>1125<br>TCT<br><br>1179     | AAG  K  GCT  A  GAT  CTT    | TCA TCA TCA TCA TCA TTA                 | AAG K 1080 GAG E 1134 GAT 1188 AAA                        |
| GAG E CCC                              | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG                                       | CAG             | P CGC         | 1044<br>ATC<br><br>I<br>1098<br>ATC<br><br>1152<br>TTG<br>1206 | V CTT             | CGA          | 1161<br>AGT                          | P TTC               | CAT CAT CAG                            | 1116<br>TCA<br>1170<br>AAA                           | GCC A GAG                | GGAACA               | 1071<br>CAC<br><br>H<br>1125<br>TCT<br><br>1179     | GCT A GAT CCA               | TCA TCA TA TCA TCA TCA TCA TCA          | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242                   |
| GAGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG                                       | CAG             | P CGC         | 1044<br>ATC<br>I<br>1098<br>ATC<br><br>1152<br>TTG<br>1206     | V CTT             | CGA          | 1161<br>1269                         | P TTC               | CAT CAT CAT CAT                        | 1116<br>TCA<br>1170<br>AAA<br>1224<br>1278           | GCC A GAG                | GGAA                 | 1179<br>1179<br>1179<br>1179                        | GCT A GAT CCA               | TCA TCA AAT                             | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT 1296          |
| GAGGE CCCC                             | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG<br>1143<br>GTT<br>1197<br>C AAC       | CAG             | P CGC         | 10444<br>ATC<br>I<br>1098<br>ATC<br>1152<br>TTG<br>1206        | CTT L AAA         | L CGA        | 1161<br>1269                         | TTC TTC ATT         | CAT H CAT CAG                          | 1116<br>TCA<br>1170<br>AAA<br>1224<br>1278           | GCC A GAG AAA AAA AAA    | GGAA                 | 1179<br>1179<br>1179<br>1179<br>1179                | GCT A GAT CTT CCA           | TCA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT- 1296 GAC     |
| GAGGE CCCC                             | L ATT       | 1035<br>CGA<br>R<br>1089<br>GTG<br>1143<br>GTT<br>1197<br>C AAC       | CAG             | P CGC         | 1044<br>ATC<br><br>1 1098<br>ATC<br><br>1206<br>CCT            | CTT L AAA GAA TCA | CGAR CTT     | 1161<br>1255<br>1161<br>1256<br>1265 | TTC F TTC ATT       | CAT  CAT  CAT  CAT  CAT  CAG  CAG      | 1116<br>TCA<br>1170<br>AAA<br>1224<br>GTT            | GCC A GAG GAG AAA        | GGAA                 | 1179<br>1179<br>1179<br>1179                        | GCT A GCT CCA CCA           | TCA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT- 1296 GAC     |
| GAGGE CCCC                             | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089<br>GTG<br>1143<br>GTT<br>1197<br>AAC  | CAG             | P CGC         | 1044<br>ATC<br>I<br>1098<br>ATC<br><br>1206<br>CCT<br>1260     | CTT L AAA GAA TCA | CGA R CTT    | 1161<br>1255<br>1161<br>1256<br>1265 | TTC F TTC ATT       | CAT  CAT  CAT  CAT  CAG  CAG  CAG  CAG | 1116<br>TCA<br>1170<br>AAA<br>1224<br>1278<br>1278   | GCC A GAG AAA GGGG A AAA | GGAA                 | 1179<br>1179<br>1179<br>1179<br>1179<br>1179        | GCT A GAT CCA TAC           | TCA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT 1296 GAC 1350 |
| Y GAGGE                                | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089<br>GTG<br>1143<br>GTT<br>1197<br>CAAC | CAG             | P CGC         | 1044<br>ATC<br><br>1098<br>ATC<br>1152<br>TTG<br>1206<br>CTT   | CTT L AAA GAA TCA | L CGA        | 1161<br>1215<br>1215<br>1215<br>1215 | TTC F TTC F ATT GCT | CAT  CAT  CAT  CAT  CAG  CAG  CAG  CAG | 1116<br>1170<br>1170<br>1170<br>1170<br>1177<br>1178 | GCC A GAG AAA GGGG A CCA | GGAATT TCCC          | 1179<br>1179<br>1179<br>1179<br>1233<br>TCT<br>1287 | GCT A GAT CCA TAC           | TCA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT 1296 GAC 1350 |
| Y GAGGE                                | L ATT       | 1035<br>CGA<br>CGA<br>R<br>1089<br>GTG<br>1143<br>GTT<br>1197<br>AAC  | CAG             | P CGC         | 1044<br>ATC<br><br>1098<br>ATC<br>1152<br>TTG<br>1206<br>CTT   | CTT L AAA GAA TCA | L CGA        | 1161<br>1215<br>1215<br>1215<br>1215 | TTC F TTC F ATT GCT | CAT  CAT  CAT  CAT  CAG  CAG  CAG  CAG | 1116<br>1170<br>1170<br>1170<br>1170<br>1177<br>1178 | GCC A GAG AAA GGGG A CCA | GGAATT TCCC          | 1179<br>1179<br>1179<br>1179<br>1233<br>TCT<br>1287 | GCT A GAT CCA TAC           | TCA | AAG K 1080 GAG E 1134 GAT 1242 TTT 1296 GAC               |

### FIG. 2C

|                     |                | _              |                    | , , , | 206            | -    | 205            | 1      | 404     |
|---------------------|----------------|----------------|--------------------|-------|----------------|------|----------------|--------|---------|
| 1359<br>AAC TGC TTC | 1368           | maa mmm        | .377               | TTTC  | 300<br>TC3 C3T | 776  | 333<br>884 GGT | בים בי |         |
| AAC TGC TTC         | TAC TGA        | rgg TTT        | ACA GCA            |       | IGA GAI        | nnG  |                |        |         |
| 1412                | 14             | 422            | 1431               |       | 1440           |      | 1449           |        | 1458    |
| GAA CAT TTO         | CCA AAG (      | GCC TAA        | GCA CGG            | CAA   | AGG AAA        | ATA  | AAC ACA        | GAA    | TAT AAT |
|                     |                |                |                    |       |                |      |                |        |         |
| 1467                | 14             | 476            | 1485               |       | 1494           |      | 1503           |        | 1512    |
| AAA ATG AGA         | TAA TCT        | AGC TTA        | AAA CTA            | TAA   | CTT CCT        | CTT  | CAG AAC        | TCC    | CAA CCA |
|                     |                |                |                    |       |                |      |                |        |         |
| 1521                | 1.             | 530            | 1539               |       | 1548           |      | 1557           |        | 1566    |
| CAT TGG ATO         | የ ጥርክ ርክክ :    | አአአ ፕሮሮ        | ጥርጥ ርጥጥ            | CAA   | AAT GAC        | TTC  | TAC AGA        | GAA    | GAA ATA |
|                     | :<br>5 1!      |                |                    |       |                |      |                |        | 1600    |
| 1575                | 1.             | 584            | 1593               |       | 1602           | maa  | TOTT           | 3.00   | 702U    |
| ATT TTT CCT         | CTG GAC        | ACT AGC        | ACT TAA            | GGG   | GAA GAT        | 166  | AAG IAA        | AGC    | CII GAA |
| 160                 | ) 1            | 630            | 1647               |       | 1656           |      | 1665           |        | 1674    |
| AAG AGT AC          | ያ ጥጥጥ እጣጣ ነ    | סטס<br>האר כדד | 7647<br>777<br>777 | AGT   | TGA CAC        | ACT  | GTT CTG        | AGA    |         |
| AAG AGI ACA         | A III ACC      | IAC GII        | AAI GAA            |       |                |      |                |        |         |
| 1681                | 3 1            | 692            | 1701               |       | 1710           |      | 1719           |        | 1728    |
| 303 CO3 E30         | T CC3 CCC      | שיים שיים      | ጥርር ፕልፕ            | ጥጥል   | ATT TTC        | TTA  | TCA ACC        | CTT    | TAA TTA |
| ACA GCA TA          |                |                |                    |       |                |      |                |        |         |
| 173'                | 7 1            | 746            | 1755               |       | 1764           |      | 1773           |        | 1782    |
| GGC AAA GA          | T ATT ATT      | AGT ACC        | CTC ATT            | GTA   | GCC ATG        | GGA  | AAA TTG        | ATG    | TTC AGT |
|                     |                |                |                    |       |                |      |                |        |         |
| 179                 | 1 <b>1</b>     | .800           | 1809               |       | 1818           |      | 1827           |        | 1836    |
| GGG GAT CA          | G TGA ATT      | AAA TGG        | GGT CAT            | ACA   | AGT ATA        | AAA  | ATT AAA        | AAA    | AAA AAA |
|                     |                |                |                    |       |                |      |                |        | 1890    |
| 184                 | 5 1            | 854            | 1863               |       | 1872           | amm. | 1881           | 3.00   |         |
| GAC TTC AT          | G CCC AAT      | CTC ATA        | TGA TGT            | GGA   | AGA ACT        | GTT  | AGA GAG        | ACC    | AAC AGG |
|                     |                |                | 1017               |       | 1926           |      | 1935           |        | 1944    |
| 189<br>GTA GTG GG   | 9 1            | .908<br>       | T31/               | TAC   | እጥጥ ጥጥር        | TAG  | AGG AGG        | TAT    | TTA ATT |
| GTA GTG GG          | I TAG AGA      | TII CCA        | GAG ICI            |       |                |      |                |        |         |
| . 195               |                |                |                    |       | 1980           |      |                |        | 1998    |
| ጥርጥ ጥርጥ <b>ር</b> ል  | C TCA TCC      | AGT GTT        | GTA TTT            | AGG   | AAT TTC        | CTG  | GCA ACA        | GAA    | CTC ATG |
|                     |                |                |                    |       |                |      |                |        |         |
| 200                 | 7 2            | 016            | -2025              |       | 2034           |      | 2043           |        | 2052    |
| ርርጥ ጥገል ልጥ          | C CCA CTA      | GCT ATT        | GCT TAT            | TGT   | CCT GGT        | CCA  | ATT GCC        | AAT    | TAC CTG |
|                     |                |                |                    |       |                |      |                |        |         |
| 206                 | 1 2            | 070            | 2079               |       | 2088           |      | 2097           |        | 2106    |
| TGT CTT GG          | A AGA AGT      | GAT TTC        | TAG GTT            | CAC   | CAT TAT        | GGA  | AGA TTC        | TTA    | TTC AGA |
|                     |                |                | <del>-</del>       |       |                |      |                |        | 0160    |
| 211                 | 5 2            | 2124           | 2133               |       | 2142           | m> > | 2151           | CAT    | 2160    |
| AAG TCT GC          | A TAG GGC      | TTA TAG        | CAA GTT            | ATT   | TAT TTT        | TAA  | AAG TIC        | CAI    | AGG IGA |
|                     |                |                | 2107               |       | 2196           |      | 2205           |        | 2214    |
| 216<br>TTC TGA TA   | 9 2            | 178<br>200 mm  | 2107               | CAC   | CAG TTA        | TGA  | TGG GAA        | GTA    | TGG AAT |
| TTC TGA TA          | G GCA GIG      | AGG TIA        | GGG AGC            | CAC   | CAG IIA        |      |                |        |         |
| 222                 | 3 2            | 2232           | 2241               |       | 2250           |      | 2259           |        | 2268    |
| GGC AGG TC          | ጋ<br>ጥ ጥርል እርኦ | <br>ጥልል ሮልጥ    | TGG CCT            | TTT   | GAG TGT        | GAC  | TCG TAG        | CTG    | GAA AGT |
| GGC AGG IC          |                |                |                    |       |                |      |                |        |         |
| 227                 | 7 2            | 2286           | 2295               | ;     | 2304           |      | 2313           |        | 2322    |
| GAG GGA AT          | C TTC AGG      | ACC ATG        | CTT TAT            | TTG   | GGG CTT        | TGT  | GCA GTA        | TGG    | AAC AGG |
|                     |                |                |                    |       |                |      |                |        |         |
| 233                 | 1 2            | 2340           | 2349               | )     | 2358           |      | 2367           |        | 2376    |
| GAC TTT GA          | G ACC AGG      | AAA GCA        | ATC TGA            | CTT   | AGG' CAT       | GGG  | AAT CAG        | GCA    | TTT TTG |
|                     |                |                |                    |       |                |      |                |        |         |

#### FIG. 2D

|      | 2201 | =    |     | 220 | 4        |     | 240 | 2    | ٠,  | 241 | 2               |     | 242         |           |     | 242  | ^            |
|------|------|------|-----|-----|----------|-----|-----|------|-----|-----|-----------------|-----|-------------|-----------|-----|------|--------------|
| CTT  | CTG. | AGG. | ccc | TAT | TAC      | CAA | GGG | ጉጥል  | ATA | CGT | <u>-</u><br>ጥጥር | ATC | ውቁራ.<br>ጥጥሮ | אאר.<br>ד | AGG | בידע | ייים<br>ייים |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      | 1GA          |
|      | :    |      |     |     | 2448     |     |     |      |     |     |                 |     |             |           |     |      | 2484         |
| CAA  |      |      |     |     | AGA      |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      | :    | 2493 |     | :   | 2502     |     | :   | 2511 |     | :   | 2520            |     | 2           | 2529      |     |      | 2538         |
| ATG  | TGG  | TAA  | GTT | TCA | TTT      | TCT | TTT | TCA  | ATC | CTC | AGG             | TTC | CCT         | GAT       | ATG | GAT  | TCC          |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     | 2556     |     |     |      |     |     |                 |     |             |           |     |      |              |
| TAT  | AAC  | ATG  |     |     | TCC      |     |     |      |     |     |                 | ATA | TTT         | GGA       | AAT | GCC  | TAT          |
|      |      |      |     |     | <br>2610 |     |     |      |     |     |                 |     |             |           |     |      |              |
|      | _    | 2601 |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
| TTA  | ATA  | CTT  | GTA |     | GCT      |     |     |      |     |     |                 |     | GGC         |           |     |      |              |
|      | ,    |      |     |     | 2664     |     |     |      |     |     |                 |     |             |           |     |      |              |
| TCD  |      |      |     |     | TTC      |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      | 2709 |     |     | 2718     |     |     |      |     |     |                 |     |             |           |     | :    |              |
| AGC  | _    |      |     |     | ACA      |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      | 2763 |     | :   | 2772     |     | :   | 2781 |     | :   | 2790            |     | 2           | 2799      |     | :    | 2808         |
| CAA  | ACC  | TGA  | TTC | CTT | CTG      | TCC | TGA | ACA  | CAT | AGC | CAG             | GCA | ATT         | TTC       | CAG | CCT  | TCT          |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             | _         |     |      |              |
|      |      |      |     |     | 2826     |     |     |      |     |     |                 |     |             |           |     |      |              |
| TTG  | AGT  | TGG  | GTA | TTA | TTA      | AAT | TCT | GGC  | CAT | TAC | TTC             | CAA | TGT         | GAG       | TGG | AAG  | TGA          |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      | -    | 2871 |     |     | 2880     |     |     |      |     |     |                 |     |             |           |     |      |              |
| CAT  | GTG  | CAA  | TTT |     | TAC      |     |     |      |     | ACC | CTC             | CCA | TGT         | GCA       | GCC | TTT  | CAT          |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
| -    | _    | 2925 |     |     | 2934     |     |     |      |     |     |                 |     |             |           |     | 22.2 |              |
| GTT  | GAC  | ATT  | AAA | TGT | GAC      |     |     |      |     |     |                 |     | AGA         |           |     |      |              |
|      | ,    | 2979 |     |     | 2988     |     |     |      |     |     |                 |     |             |           |     |      |              |
| AAG  |      |      |     |     | AAA      |     |     |      |     |     |                 |     |             |           |     |      |              |
| AA-0 |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      | 3033 |     |     | 3042     |     | - 4 | 3051 |     | :   | 3060            |     | 3           | 069       |     | 3    | 3078         |
| CCC  | _    |      |     |     | ACG      |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      | 3    | 3087 |     |     | 3096     |     | 3   | 3105 |     | :   | 3114            |     | 3           | 123       |     | 3    | 3132         |
| GTC  | AAG  | AAA  | AAA | AAA | AAA      | AAA | AAA | AAA  | AAA | AAA | AAA             | AAA | AAA         | AAA       | AAA | AAA  | AAA          |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |
|      |      |      |     |     |          |     |     |      |     |     |                 |     |             |           |     |      |              |

AAA A 3'

Figure 3: Protein Sequence for 101P3A11 (piece of SEQ ID NO:2880)

MVDPNGNESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDÏLI STSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLRHATVLTLPRVTKIGV AAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYL LILKTVLGLTREAQAKAFGTCVSHVCAVFIFYVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYG VKTKEIRQRILRLFHVATHASEP

#### Figure 4

+ +L Sbjct: 303 RILRL 307 (SEQ ID NO:2882)

Alignment of 101P3A11 (Sbjct) with mouse olfactory receptor S25 (Query) Query: 34 GNYTVVTEFILLGLTDDITVSVILFVMFLIVYSVTLMGNLNIIVLIRTSPQLHTPMYLFL 93 GN + T FIL+GL L +Y + ++GNL II ++RT LH PMY+FL GNESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFL 65 Sbjct: 6 Query: 94 SHLAFLDIGYSSSVTPIMLRGFLRKGTFIPVAGCVAQLCIVVAFGTSESFLLASMAYDRY 153 L+ +DI S+S P ML F T I C+Q+++ ES +L +MA+DRY Sbjct: 66 CMLSGIDILISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRY 125 Query: 154 VAICSPLLYSTQMSSTVCILLVGTSYLGGWVNAWIFTGCSLNLSFCGPNKINHFFCDYSP 213 L FC N ++H +C + VAIC PL ++T ++ + + + G Sbjct: 126 VAICHPLRHATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQD 185 Query: 214 LLKLSCSHDFSFEVIPAISSGSIIVVTVFIIALSYVYILVSILKMRSTEGRQKAFSTCTS 273 ++KL+C V I S I + +I+ SY+ IL ++L + + E + KAF TC S Sbjct: 186 VMKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVS 244 Query: 274 HLTAVTLFFGTITFIYVMPQSSYSTDQNK----VVSVFYTVVIPMLNPLIYSFRNKEVKE 329 H+ AV +F+ + FI + +S ++ '+++ Y +V P+LNP++Y + KE+++ Sbjct: 245 HVCAVFIFY--VPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQ 302 Query: 330 AMKKL 334 (SEQ ID NO:2881)

Figure 23: Alignment of 101P3A11-PHOR-1 with the rat GPCR RA1C (gi|3420759).

Identities = 179/299 (59%), Positives = 231/299 (76%), Gaps = 1/299 (0%)

- PHOR: 14 FILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDI 73 F+LIG+PGLEEA FW FPL S+Y +A+ GN +++IVRTE SLH PMY+FLCML+ ID+
- RAIC: 11 FMLIGIPGLEEAHFWFGFPLLSMYAVALFGNCIVVFIVRTERSLHAPMYLFLCMLAAIDL 70
- PHOR: 74 LISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLR 133 +STS+MPK+LA+FWF+S I FDACL Q+F IH+LS +EST+LLAMAFDRYVAICHPLR
- RAIC: 71 ALSTSTMPKILALFWFDSREITFDACLAQMFFIHALSAIESTILLAMAFDRYVAICHPLR 130
- PHOR: 134 HATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDD 193
  HA VL +IG+ A+VRG+ PLP+ IK+L FC SN+LSHSYC+HQDVMKLA D
- RAIC: 131 HAAVLNNTVTVQIGMVALVRGSLFFFPLPLLIKRLAFCHSNVLSHSYCVHQDVMKLAYTD 190
- PHOR: 194 IRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSHVCAVFIF 252
- NVVYGL I+ +G+D + IS SY LI++ VL L ++ +AKAFGTCVSH+ V F RA1C: 191 TLPNVVYGLTAILLVMGVDVMFISLSYFLIIRAVLQLPSKSERAKAFGTCVSHIGVVLAF 250
- PHOR: 253 YVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRILRLFHVA 311 (SEQ ID NO:2883)
  YVP IGLS+VHRF D + V++ ++YLL+PPV+NPI+YG KTK+IR R+L +F ++
- YVP IGLS+VHRF D + V++ ++YLL+PPV+NPI+YG KTK+IR R+L +F ++
  RAIC: 251 YVPLIGLSVVHRFGNSLDPIVHVLMGDVYLLLPPVINPIIYGAKTKQIRTRVLAMFKIS 309 (SEQ ID NO:2884)

Figure 24: Alignment of 101P3A11-PHOR-1 with the human prostate specific GPCR.(gi|13540539)

Identities = 179/299 (59%), Positives = 233/299 (77%), Gaps = 1/299 (0%)

- PHOR: 14 FILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDI 73 F+LIG+PGLE+A FW+ FPL S+Y++A+ GN +++IVRTE SLH PMY+FLCML+ ID+
- GPCR: 11 FVLIGIPGLEKAHFWVGFPLLSMYVVAMFGNCIVVFIVRTERSLHAPMYLFLCMLAAIDL 70
- PHOR: 74 LISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLR 133
- +STS+MPK+LA+FWF+S I F+ACL Q+F IH+LS +EST+LLAMAFDRYVAICHPLR GPCR: 71 ALSTSTMPKILALFWFDSREISFEACLTQMFFIHALSAIESTILLAMAFDRYVAICHPLR 130
- PHOR: 134 HATVLTLPRVTKIGVANVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDD 193
- HA VL +IG+ AVVRG+ PLP+ IK+L FC SN+LSHSYC+HQDVMKLA D
- GPCR: 131 HAAVLNNTVTAQIGIVAVVRGSLFFFPLPLLIKRLAFCHSNVLSHSYCVHQDVMKLAYAD 190
- PHOR: 194 IRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSHVCAVFIF 252 NVVYGL I+ +G+D + IS SY LI++TVL L ++ +AKAFGTCVSH+ V F
- GPCR: 191 TLPNVVYGLTAILLVMGVDVMFISLSYFLIIRTVLQLPSKSERAKAFGTCVSHIGVVLAF 250
- PHOR: 253 YVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRILRLFHVA 311 (SEQ ID NO:2885)
  YVP IGLS+VHRF + V++ +IYLL+PPV+NPI+YG KTK+IR R+L +F ++
- GPCR: 251 YVPLIGLSVVHRFGNSLHPIVRVVMGDIYLLLPPVINPIIYGAKTKQIRTRVLAMFKIS 309 (SEQ ID NO:2886)

Figure 25: Alignment with human olfactory receptor 5II12 (gi]14423836)

Identities = 163/304 (53%), Positives = 214/304 (69%), Gaps = 1/304 (0%)

- PHOR: 7 NESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLC 66 N + +F+L G+PGLE + WL+ PLC +Y +A+ GN I+ VR E SLHEPMY FL
- HOR5: 5 NVTHPAFFLLTGIPGLESSHSWLSGPLCVMYAVALGGNTVILQAVRVEPSLHEPMYYFLS 64
- PHOR: 67 MLSGIDILISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYV 126 MLS D+ IS +++P +L F N+ I FDACL+Q+F IH S MES +LLAM+FDRYV
- HOR5: 65 MLSFSDVAISMATLPTVLRTFCLNARNITFDACLIQMFLIHFFSMMESGILLAMSFDRYV 124
- PHOR: 127 AICHPLRHATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDV 186
  AIC PLR+ATVLT + +G+ A R + PLP IK+LP CRSN+LSHSYCLH D+
- HOR5: 125 AICDPLRYATVLTTEVIAAMGLGAAARSFITLFPLPFLIKRLPICRSNVLSHSYCLHPDM 184
- PHOR: 187 MKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSH 245
  M+LAC DI +N +YGL V++S G+D I SY+LIL++V+ +RE + KA TCVSH
- HOR5: 185 MRLACADISINSIYGLFVLVSTFGMDLFFIFLSYVLILRSVMATASREERLKALNTCVSH 244
- PHOR: 246 VCAVFIFYVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRIL 305
- + AV FYVP IG+S VHRF K + V+++N+YL VPPVLNP++Y KTKEIR+ I
  . HOR5: 245 ILAVLAFYVPMIGVSTVHRFGKHVPCYIHVLMSNVYLFVPPVLNPLIYSAKTKEIRRAIF 304
- PHOR: 306 RLFH 309 (SEQ ID NO:2887)

R+FH

HOR5: 305 RMFH 308 (SEQ ID NO:2888)

Figure 1 (SEQ TO NO: 2878)

### FIG. 2A (SEQ TO MOS: 1879 \$ 2880)

|    |      |       | 9          |      |     | 18  |     |     |       |     |     |       |     |                  | 45         |            |      | 54         |
|----|------|-------|------------|------|-----|-----|-----|-----|-------|-----|-----|-------|-----|------------------|------------|------------|------|------------|
| 5' |      |       |            |      |     |     |     |     |       |     |     |       |     |                  | GAG        |            | GAC  | TGG        |
|    |      |       | 63         |      |     | 72  |     |     | 81    |     |     | 90    |     |                  | 99         |            |      | 108        |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  | CCT        |            | TGG  | TGC        |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    |      |       | 117        |      |     | 126 |     |     |       |     |     | 144   |     |                  | 153        |            |      | 162        |
|    |      |       |            |      |     |     |     |     |       | GTG | GAT | CCC   | AAT | GGC              | AAT        | GAA        | TCC  | AGT        |
|    |      |       |            |      |     |     |     | M   | M     |     | D D | <br>ъ | N   | G                | N          | E          | s    | s          |
|    |      |       |            |      |     |     |     |     |       |     |     | Ā     |     | J                | -          | _          |      | _          |
|    |      |       | 171        |      |     |     |     |     |       |     |     | 198   |     | <i></i>          |            | a. a       |      | 216        |
|    | GCT  | ACA   | TAC        | TTC  | ATC | CTA |     |     | CFC   |     | GGT | TTA   |     | GAG              | GCT        | CAG        | TTC  | TGG        |
|    | A    | T     | ¥          | F    | I   | L   | I   |     |       |     | G   |       |     | E                | A          | Q          | F    | W          |
|    |      |       | 005        |      |     |     |     |     | 242   |     |     | 252   |     |                  | 263        |            |      | 270        |
|    | TTG  | GCC   | 225<br>TTC | CCA  | TTG |     |     |     |       |     |     |       |     |                  | GGT        | AAC        |      |            |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | L    | A     | F          | P    | L   | С   | S   | L   | Y     | L   | I   | A     | v   | L                | G          | N          | L    | T          |
|    |      |       | 279        |      |     | 288 |     |     | 297   |     |     | 306   |     |                  | 315        |            |      | 324        |
|    | ATC  | ATC   |            | ATT  | GTG | CGG | ACT | GAG | CAC   | AGC | CTG | CAT   | GAG | CCC              | ATG        | TAT        | ATA  | TTT        |
|    |      |       |            |      |     |     |     |     |       |     |     |       | E   |                  | м          |            | ī    | <br>F      |
|    | I    | I     | ¥          | I    | ٧   | R   | Т   | ь   | п     | 5   | 71  | п     | ь   | P                | m          |            |      | F          |
|    |      |       | 333        |      |     | 342 |     |     |       |     |     |       |     |                  | 369        |            |      | 378        |
|    | CTT  | TGC   | ATG        | CTT  | TCA | GGC | ATT | GAC | ATC   | CTC | ATC | TCC   | ACC | TCA              | TCC        | ATG        | CCC  | AAA        |
|    | L    | c     | м          | L    | s   | G   | I   | D   | ī     | L   | I   | s     | T   | s                | s          | M          | P    | ĸ          |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | 3.00 | ama   | 387        | 3.00 | mma | 396 |     |     |       |     | 200 |       |     | man              | 423<br>GAT |            | m/Cm | 432        |
|    | AIG  |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | M    | L     | A          | I    | F   | W   | F   |     |       | T   | T   | I     | Q   | F                | D          | A          | C    | L          |
|    |      |       | 441        |      |     | 450 |     | • • |       |     |     | 468   |     |                  | 477        |            |      | 486        |
|    | CTA  | CAG   |            | TTT  | GCC |     |     |     |       |     |     |       |     | TCC              | ACA        |            | CTG  |            |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | L    | Q     | I          | F    | A   | I   | н   | S   | L     | s   | G   | M     | B   | s                | T          | . <b>v</b> | r    | L          |
|    |      |       | 495        |      |     | 504 |     |     | 513   |     |     | 522   |     |                  | 531        |            |      | 540        |
|    | GCC  | ATG   | GCT        | TTT  | GAC | CGC | TAT | GTG | GCC   | ATC | TGT | CAC   | CCA | CTG              | CGC        | CAT        | GCC  | ACA        |
|    |      | <br>м |            | F    | D   | R   | Y   | v   | <br>A | I   | c   | H     | P   | L                | R          | н          |      | T          |
|    | •    | •••   | •          | •    | _   |     |     |     |       |     |     |       |     | _                |            |            |      |            |
|    |      |       | 549        |      |     |     |     |     | 567   |     |     |       |     |                  | 585        |            | ~~~  | 594        |
|    | GTA  | CTT   | ACG        | TTG  |     |     |     |     |       |     | GGT |       | GCT | GCT              | GTG        | GTG        | CGG  | GGG        |
|    | v    | L     | T          | L    |     |     |     |     |       |     |     |       | A   | $\mathbf{A}^{'}$ | v          | v          | R    | G          |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | COT  | CCA   | 603        | አጥሮ  | GCA |     |     |     |       |     |     |       | CAG |                  | 639<br>CCC | ጥጥር        |      | 648<br>CGC |
|    |      |       |            |      |     |     |     |     |       |     |     |       |     |                  |            |            |      |            |
|    | Δ    | A     | T.         | м    | Α   | ъ   | T.  | Þ   | v     | F   | т   | ĸ     | 0   | L                | Þ          | F          | C    | R          |

FIG. 2B

|                         |                 | 657   |                     |   | 666   |                      |                 | 675  | 1 1             |               | 684   |   |  | 693  |                      |   | 702  |
|-------------------------|-----------------|---|---------------------|---|---|----------------------|-----------------|--|-----------------|---------------|---|---|--|--|----------------------|---|--|
| TCC                     | AAT             | ATC   | CTT                 | TCC   | CAT   | TCC                  | TAC             | TGC  | CTA             | CAC           | CAA   | GAT   | GTC  | ATG  | AAG                  | CTG                                     | GCC  |
|                         |                 |   |                     |   |   |                      |                 |  |                 |               |   |   |  |  |                      |   |  |
| S                       | N               | I   | L                   | S   | H   | S                    | Y               | C  | L               | H             | Q   | D   | v  | M  | K                    | L                                       | A  |
|                         |                 |   |                     |   |   |                      |                 |  |                 |               |   |   |  |  |                      |   | 256  |
|                         |                 | 711   |                     |   | 720   |                      |                 | 729  |                 |               | 738   |   |  | 747  |                      | maa                                     | 756  |
| TGT                     | GAT             | GAT   | ATC                 | CGG   | GTC   | AAT                  | GTC             | GTC  |                 |               |   |   | GTC  | ATC  | ATC                  | TCC                                     | GCC  |
|                         |                 |   |                     |   |   |                      |                 |  |                 |               |   |   |  |  |                      |   | <br>A  |
| C                       | D               | D   | I                   | R   | v   | N                    | v               | V  | Y               | G             | ъ   | Ι.  | ٧  | 1  | I                    | S                                       | A  |
|                         |                 |   |                     |   |   |                      |                 |  |                 |               | =00   |   |  | 801  |                      |   | 810  |
|                         |                 | 765   |                     |   | 774   |                      |                 | 783  |                 | ma3           | 792   | CTC   | Omm  |  | CTT                  | 330                                     |  |
| ATT                     | GGC             | CTG   | GAC                 |   |   |                      |                 | TCC  |                 |               | TAT   | CIG   |  | AII  |                      | AAG                                     | ACI  |
|                         |                 |   |                     |   |   |                      |                 | s  |                 |               |   |   | L  | I  | L                    | ĸ                                       | T  |
| I                       | G               | L   | D                   | S   | ь   | 1.                   | 1               | 5  | F               | 5             | -   |   |  | _  | _                    | ••                                      | -  |
|                         |                 |   |                     |   |   |                      |                 | 837  |                 |               | 846   |   |  | 855  |                      |   | 864  |
|                         |                 | 819   |                     |   | 828   |                      | 000             | CAG  | ecc             | 220           |   | TTT   | GGC  |  | TGC                  | GTC                                     |  |
| GTG                     | TTG             | GGC   | TTG                 | ACA   | CGT   | GAA                  |                 | CAG  |                 | AAG           |   |   |  |  |                      |   |  |
|                         |                 |   |                     |   |   |                      |                 | Q  |                 |               |   | F   | G  | T  | С                    | v                                       | s  |
| v                       | L               | G   | L                   | T   | R   | B                    | A               | Q  | A               |               | •   | -   | •  | -  | •                    | •                                       | _  |
|                         |                 |   |                     |   | 882   |                      |                 | 891  |                 |               | 900   |   |  | 909  |                      |   | 918  |
|                         |                 | 873   | 0.00                | arc.  | 004<br>mm/3   | אידא                 | <del>ጥ</del> ጥር | TAT  | GTA             | CCT           |   | ATT   | GGA  |  | TCC                  | ATG                                     | GTG  |
| CAT                     | GTG             | TGT   | GCT                 | GIG   | 110   |                      |                 |  |                 |               |   |   |  |  |                      |   |  |
|                         |                 | c   |                     | 37  |   |                      |                 | Y  |                 |               | F   | I   | G  | L  | S                    | M                                       | v  |
| H                       | ٧               | C   | A                   | ٧   | F   | _                    | •               | -  | •               | _             | _   |   | _  |  |                      |   |  |
|                         |                 | 927   |                     |   | 936   |                      |                 | 945  |                 |               | 954   |   |  | 963  |                      |   | 972  |
| @3.E                    | 000             | 721<br>mmm  | N.C.C               | 330   | CGG   | ССТ                  | GAC             | TCT  | CCG             | CTG           |   |   | ATC  | TTG  | GCC                  | AAT                                     | ATC  |
| CAT                     | CGC             | 111   | AGC                 | AAG   |   |                      |                 |  |                 |               |   |   |  |  |                      |   |  |
|                         |                 |   | s                   | ĸ   | ) <b>B</b>  | R                    | D               | s  | P               | L             | P   | v   | I  | L  | A                    | N                                       | I  |
|                         |                 |   |                     |   |   |                      |                 |  |                 |               |   |   |  |  |                      |   |  |
| H                       | R               | •   | _                   |   |   |                      |                 |  |                 |               |   |   |  |  |                      |   |  |
| н                       | R               |   |                     |   |   |                      |                 |  |                 |               | 1008  |   |  | 1017   |                      |   | 1026   |
|                         |                 | 0.01  |                     |   | 990   |                      |                 | 999  |                 |               | 1008<br>GTC   | TAT   |  |  |                      |   |  |
|                         | CTG             | 981<br>CTG  |                     |   | 990   |                      | CTC             |  | CCA             | ATT           | GTC   | TAT   | GGA  |  |                      |   |  |
| TAT                     | CTG             | 981<br>CTG  | GTT                 | CCT   | 990<br>CCT  | GTG                  | CTC             | 999<br>AAC   | CCA             | ATT           | GTC   | TAT   | GGA  |  | AAG                  | ACA                                     |  |
|                         | CTG             | 981<br>CTG  | GTT                 | CCT   | 990<br>CCT  | GTG<br><br>V         | CTC             | 999<br>AAC<br><br>N                                  | CCA<br><br>P    | ATT           | GTC<br><br>V  | TAT   | GGA<br><br>G                               | GTG<br><br>V   | AAG<br><br>K         | ACA<br>T                                | AAG<br><br>K                                     |
| TAT                     | CTG             | 981<br>CTG  | GTT<br><br>V        | CCT<br>P  | 990<br>CCT<br><br>P   | GTG<br><br>V         | CTC<br><br>L    | 999<br>AAC<br><br>N                                  | CCA<br><br>P    | ATT           | GTC<br><br>V<br>1062  | TAT<br><br>Y                                | GGA<br><br>G                               | GTG<br><br>V<br>1071   | AAG<br><br>K         | ACA<br>T                                | AAG<br>K<br>1080                                 |
| TAT                     | CTG             | 981<br>CTG  | GTT<br><br>V        | CCT<br>P  | 990<br>CCT<br><br>P   | GTG<br><br>V         | CTC<br><br>L    | 999<br>AAC<br><br>N                                  | CCA<br><br>P    | ATT           | GTC<br><br>V<br>1062  | TAT<br><br>Y                                | GGA<br><br>G                               | GTG<br><br>V<br>1071   | AAG<br><br>K         | ACA<br>T                                | AAG<br>K<br>1080                                 |
| TAT                     | CTG             | 981<br>CTG  | GTT<br><br>V        | CCT<br>P  | 990<br>CCT<br><br>P   | GTG<br><br>V         | CTC<br><br>L    | 999<br>AAC<br><br>N                                  | CCA<br><br>P    | ATT           | GTC<br><br>V<br>1062  | TAT<br><br>Y                                | GGA<br><br>G                               | GTG<br><br>V<br>1071   | AAG<br><br>K         | ACA<br>T                                | AAG<br>K<br>1080                                 |
| TAT Y GAG               | CTG             | 981<br>CTG<br><br>L<br>1035   | V                   | P   | 990<br>CCT<br>P<br>1044   | GTG<br>V<br>V        | CTC             | 999<br>AAC<br><br>N<br>1053<br>- CTT                 | CCA<br>P        | ATT           | GTC<br>V<br>1062<br>GTG   | TAT Y GCC                                   | GGA<br>G<br>ACA                            | GTG<br><br>V<br>1071   | AAG<br>K<br>K<br>GCT | TCA                                     | AAG<br>K<br>1080                                 |
| TAT                     | CTG             | 981<br>CTG  | V                   | CCT<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC  | GTG<br>V<br>CTT      | CTC             | 999<br>AAC<br><br>N<br>1053<br>- CTT<br><br>L        | CCA<br>P<br>TTC | ATT I CAT     | GTC<br>V<br>1062<br>GTG<br>V                                    | TAT Y GCC                                   | GGA<br>G<br>ACA                            | GTG<br>V<br>1071<br>CAC<br><br>H                                       | AAG<br>K<br>GCT      | TCA                                     | AAG<br><br>K<br>1080<br>GAG<br><br>E             |
| TAT<br>Y<br>GAG         | CTG             | 981<br>CTG<br><br>L<br>1035<br>CGA<br><br>R                                       | GTT<br>V<br>CAG     | CCT<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I   | GTG<br>V<br>CTT      | CTC L CGA       | 999<br>AAC<br><br>N<br>1053<br>CTT<br><br>L          | CCA<br>P<br>TTC | ATT I CAT     | GTC V 1062 GTG V  | TAT Y GCC                                   | GGA<br>G<br>ACA                            | GTG<br><br>V<br>1071<br>CAC<br><br>H                                   | AAG<br>K<br>GCT      | ACA<br>T<br>TCA                         | AAG<br><br>K<br>1080<br>GAG<br><br>E             |
| TAT Y  GAG              | CTG L ATT       | 981<br>CTG<br><br>L<br>1035<br>CGA<br><br>R                                       | GTT<br>V<br>CAG     | CGC<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I   | GTG V CTT            | CTC L CGA       | 999 AAC N 1053 CTT L 1107                            | CCA<br>P<br>TTC | ATT I CAT     | GTC V 1062 GTG V 1116   | TAT Y GCC A GAG                             | GGA<br>G<br>ACA<br>T                       | GTG V 1071 CAC H 1125  | AAG K GCT A          | TCA                                     | AAG<br><br>K<br>1080<br>GAG<br><br>E             |
| TAT Y  GAG              | CTG L ATT       | 981<br>CTG<br><br>L<br>1035<br>CGA<br><br>R                                       | GTT<br>V<br>CAG     | CGC<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I   | GTG V CTT            | CTC L CGA       | 999 AAC N 1053 CTT L 1107                            | CCA<br>P<br>TTC | ATT I CAT     | GTC V 1062 GTG V 1116   | TAT Y GCC A GAG                             | GGA<br>G<br>ACA<br>T                       | GTG V 1071 CAC H 1125  | AAG K GCT A          | TCA                                     | AAG K 1080 GAG E 1134 GAT                        |
| TAT Y  GAG E            | CTG L ATT       | 981<br>CTG<br><br>L<br>1035<br>CGA<br><br>R                                       | GTT<br>V<br>CAG     | CGC<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I   | GTG V CTT            | CTC L CGA       | 999<br>AAC<br><br>N<br>1053<br>CTT<br><br>L          | CCA<br>P<br>TTC | ATT I CAT     | GTC V 1062 GTG V 1116   | TAT Y GCC A GAG                             | GGA<br>G<br>ACA<br>T                       | GTG V 1071 CAC H 1125  | AAG K GCT A          | TCA                                     | AAG<br><br>K<br>1080<br>GAG<br><br>E             |
| TAT Y  GAG              | CTG L ATT       | 981<br>CTG<br><br>L<br>1035<br>CGA<br><br>R                                       | GTT<br>V<br>CAG     | CGC<br>P<br>CGC                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I   | GTG V CTT            | CGA<br>CGA<br>R | 999<br>AAC<br><br>N<br>1053<br>CTT<br><br>L<br>1107  | CCA<br>P<br>TTC | CAT<br>H      | 0 GTC<br>V<br>1062<br>GTG<br>V<br>1116                          | TAT Y GCC A GAG                             | GGA G ACA T TCC                            | GTG<br><br>V<br>1071<br>CAC<br><br>H<br>1125                           | AAG K GCT A GAT      | TCA                                     | AAG K 1080 GAG E 1134 GAT                        |
| TAT Y GAG               | CTG L ATT       | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089                                       | CAG                 | CCT P CGC R                                       | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC                                | GTG<br>V<br>CTT<br>L | CTC L CGA       | 999<br>AAC<br><br>N<br>1053<br>CTT<br><br>L<br>1107  | CCA<br>P<br>TTC | CAT           | GTC V 1062 V 1116 TCA   | TAT Y GCC A GAG                             | GGA G ACA T TCC                            | GTG V 1071 CAC H 1125 TCT  | AAG K GCT A GAT      | TCA                                     | AAG K 1080 GAG E 1134 GAT                        |
| TAT Y GAG               | CTG L ATT       | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089                                       | CAG                 | CGC R   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC                                | GTG<br>V<br>CTT<br>L | CTC L CGA R CTT | 999<br>AAC<br>N<br>1053<br>CTT<br>L<br>1107<br>CTT   | CCA P TTC       | CAT           | 1062<br>GTG<br>GTG<br>V<br>1116                                 | TAT Y GCC A GAG                             | GGA G ACA T T TCC                          | GTG V 1071 CAC H 1125 TCT  | AAG  K  GCT  A  GAT  | TCA S TCA                               | AAG K 1080 GAG E 1134 GAT 1188                   |
| TAT Y GAG               | CTG L ATT I TAG | 981<br>CTG<br>  | CAG                 | CGC R   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC                                | GTG V CTT L          | CTC L CGA R CTT | 999 AAC N 1053 -CTT L 1161 AGT                       | CCA P TTC       | CAT H CAT     | GTC V 1116 TCA 1170 G AAA                                       | TAT Y GCC A GAG                             | GGA G ACA T T AAT                          | GTG V 1071 CAC H 1125 TCT  | AAG  K  GCT  A  GAT  | TCA<br>S<br>TCA                         | AAG K 1080 GAG E 1134 GAT 1188                   |
| GAG CCC P               | L ATT I TAG     | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089<br>GTG                                | CAG                 | CGC P CGCC R                                      | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC                                | GTG V CTT L          | CTC L CGA R CTT | 999 AAC N 1053 -CTT L 1107 1161 AGT                  | CCA P TTC       | CAT H CAT     | 1062<br>GTG<br>GTG<br>V<br>1116<br>TCA                          | TAT Y GCC A GAG                             | GGA G ACA T TCC                            | GTG V 1071 CAC H 1125 TCT 1179   | AAG K GCT A GAT      | TCA<br>TCA                              | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242          |
| TAT Y GAG CCC P         | CTG L ATT I TAG | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089<br>GTG                                | CAG                 | CGC P CGC R                                       | 990<br>CCT<br>P<br>1044<br>ATC<br>1098<br>ATC   | GTG V CTT L AAA      | CTC L CGA R CTT | 999 AAC N 1053 -CTT L 1107 1161 AGT 1215             | CCA P TTC F TTC | CAT CAT       | 1062<br>GTG<br>GTG<br>V<br>1116<br>TCA<br>1170<br>S AAA<br>1224 | TAT Y GCC A GAG                             | GGA G ACA T TCC                            | GTG V 1071 CAC H 1125 TCT 1179 TTC                                     | AAG K GCT A GAT      | TCA TCA TCA TCA TCA TCA TCA TCA TCA TTA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1 1242 TTT    |
| TAT Y GAG CCC P         | CTG L ATT I TAG | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089<br>GTG                                | CAG                 | CGC P CGC R                                       | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC                                | GTG V CTT L AAA      | CTC L CGA R CTT | 999 AAC N 1053 -CTT L 1107 1161 AGT 1215 ATG         | CCA P TTC       | CAT H CAT     | 1062<br>GTG<br>V<br>1116<br>TCA<br>1170<br>AAA<br>1224          | TAT Y GCC A GAG                             | GGA G ACA T TCC GAA                        | 1179<br>1179<br>1233   | GCT A GAT CCA        | TCA TCA TCA TCA TCA TCA TCA TCA TCA TTA | AAG K 1080 GAG E 1134 GAT 1188 AAA 1 1242 TTT    |
| GAG GAG CCC             | CTG L ATT I TAG | 981<br>CTG<br><br>L<br>1035<br>CGA<br>1089<br>GTG<br>1143                         | CAG                 | CCT P CGC R                                       | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC<br><br>1206                    | GTG V CTT L AAA      | CTC L CGA R CTT | 999 AAC N 1053 -CTT L 1107 1161 AGT 1215             | CCA P TTC F TTC | CAT H CAT     | 1116<br>1170<br>1170<br>1224<br>1278                            | TAT Y GCC A GAG                             | GGA ACA TCC                                | 1071<br>CAC<br><br>H<br>1125<br>TCT<br><br>1179<br>TTC<br>1233         | GAT CTT CCA          | TCA TCA TCA TCA TCA TCA TCA TCA         | AAG K 1080 GAG E 1134 GAT 1188 AAA 1242 TTT 1296 |
| TAT Y GAG CCC P TTT AAA | CTG L ATT I TAG | 981<br>CTG<br>  | GTT V CAG           | CCT P CGC R GTG GTG GTG GTG GTG GTG GTG GTG GTG G | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC<br><br>1206                    | GTG                  | CTC L CGA R CTT | 999 AAC N 1053 -CTT 1161 AGT 1215 AGT 1269           | CCA P TTC F TTC | CAT H CAT     | 1116<br>1170<br>1170<br>1278                                    | TAT Y GCC A GAG GAG GAG AAAA                | GGA ACA TCC TCC TCC TCC TCC TCC TCC TCC TC | 1179<br>1179<br>1233<br>1237   | GAT CTT CCA          | TCA | AAG K 1080 GAG E 1134 GAT 1242 TTT 1296 GAC      |
| TAT Y GAG CCC P TTT AAA | CTG L ATT I TAG | 981<br>CTG<br>  | GTT V CAG           | CCT P CGC R GTG GTG GTG GTG GTG GTG GTG GTG GTG G | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC<br><br>1206                    | GTG                  | CTC L CGA R CTT | 999 AAC N 1053 -CTT 1161 AGT 1215 AGT 1269           | CCA P TTC F TTC | CAT H CAT     | 1116<br>1170<br>1170<br>1278                                    | TAT Y GCC A GAG GAG AAAA AAAA AAAA AAAA AAA | GGA ACA TCC TCC TCC TCC TCC TCC TCC TCC TC | 1179<br>1179<br>1233<br>1237   | GAT CTT CCA          | TCA | AAG K 1080 GAG E 1134 GAT 1242 TTT 1296 GAC      |
| GAG CCC P               | CTG L ATT I TAG | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089<br>GTG<br>1143<br>CGTT<br>1197        | CAG CAG CAG TCA TCA | CCT P CGC R GTG                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>1098<br>ATC<br>1206<br>CCT<br>1260              | GTG V CTT L GAA      | CTC L CGA R CTT | 999 AAC N 1053 CTT L 1161 AGT 1215 ATG 1269          | CCA P TTC       | CAT H CAT     | 1116<br>1170<br>1170<br>1170<br>1224<br>1224<br>1224            | TAT Y GCC A GAG AAA GGGG A AAA              | GGA ACA TCC TCC TCC TCC TCC TCC TCC TCC TC | 1071<br>CAC<br><br>H<br>1125<br>TCT<br><br>1233<br>TCT<br>1287<br>1287 | GCT A GAT CCA TAC    | TCA | AAG K 1080 GAG E 1134 GAT 1242 TTT 1296 GAC 1350 |
| GAG CCC P               | CTG L ATT I TAG | 981<br>CTG<br>L<br>1035<br>CGA<br>R<br>1089<br>GTG<br>1143<br>CGTT<br>1250<br>TAN | CAG CAG CAG CTCA    | CCT P CGC R GTG                                   | 990<br>CCT<br><br>P<br>1044<br>ATC<br><br>I<br>1098<br>ATC<br>1206<br>CCT<br>1206<br>CCTT | GTG V CTT L GAA      | CTC L CGA R GAC | 999 AAC N 1053 CTT L 1107 CTT 1215 ATG 1215 CTT 1323 | CCA P TTC F TTC | CAT H CAT CAG | 1116<br>1170<br>1170<br>1170<br>1224<br>1278<br>1778            | TAT Y GCC A GAG AAA GGGG A AAA CGGGG A CCA  | GGA ACA TCCC TCCC TCCC TAT                 | 1179<br>1179<br>1179<br>1179<br>1179<br>1179<br>1233<br>1171<br>1287   | GCT A GAT CCA TAC    | TCA | 1080 GAG E 1134 GAT 1242 TTT 1296 GAC            |

#### FIG. 2C

|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         | *,   |
|-----|---------------|-------|-------|-------|--------|-------|--------------|------------------|-------------|--------|---------|-----------------|--------------|----------|--------|---------|------|
|     | 135           | 9     |       | 136   | 8      |       | 1377         | 7                | 7 1         | 1386   | 5       |                 | 1395         | ;        |        | 1404    |      |
| AA  | C TG          | C TT  | C TA  | C TG  | A TGO  | 3 TTI | CACA         | A GC             | A TTC       | TG     | A GAT   | י אאר           | דממי         | car      | F 3/C2 | Tr Com  | 303  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 141   | 3     |       | 1422   | 2     |              | 1437             |             |        | 1440    | ١               |              | 7440     | ,      |         |      |
| GA. | A CA          | T TT  | G CC  | A AAG | G GCC  | TA    | GC           | CGC              | -<br>2 CA7  | ACC    | מבבב    | י<br>איייא      | 330          | T 3 72 1 | , ,,,  |         | 1458 |
|     |               |       |       |       |        |       |              |                  | CAL         | AGG    | 7 AM    | AIP             | AAC          | ACA      | A GAA  | TAT     | AAT  |
|     |               | 146   | 7     |       | 1476   |       |              | 140              | - <b></b> - |        |         |                 |              |          |        |         |      |
| 337 | \ <b>N</b> TP | 770   | 7     |       | 14/6   | ,<br> |              | 1485             |             |        | 1494    | :               |              | 1503     | 3      |         | 1512 |
| MAA | · MI          | G AG  | A TAI | A TC  | r. AGC | TTA   | AAA          | CT               | A TAA       | CTI    | CCI     | CTT             | CAG          | AAC      | TCC    | CAA     | CCA  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          | ·      |         |      |
|     |               | 152   | 1     |       | 1530   | )     |              | 1539             | )           |        | 1548    | :               |              | 1557     | ,      |         | 1566 |
| CAT | TG            | G AT  | CTC   | \ GAZ | AAA A  | TGC   | TGT          | י רידים          | מבים יו     | ד מ מ  | CAC     | THE PROPERTY OF | ma.          | 202      |        |         |      |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 157   | 5     |       | 1584   |       |              | 1593             | }           |        | 1602    |                 |              | 1611     |        |         | 1620 |
| ATI | TT            | r cc: | r cre | GAC   | ACT    | AGC   | ACT          | TAA              | GGG         | GAA    | GAT     | TGG             | AAG          | ጥልል      | ACC    |         | C    |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          | . AGC  | CII     | GAA  |
|     |               | 162   | 9     |       | 1638   |       |              | 1647             | ,           |        | 1656    |                 |              | 1665     |        | <b></b> |      |
| AAG | AG:           | r ac  | A TTI | ACC   | TAC    | CTT   | יימג         | CAA              | ) A C T     | - TO 7 | 7030    | 3.00            |              | T003     |        |         | 1674 |
|     |               |       |       |       |        |       | AAI          | GAL              | LAGI        | IGA    | . CAC   | ACT             | GTT          | CTG      | AGA    | GTT     | TTC  |
| -   |               | 1687  | 2     |       | 1602   |       |              |                  |             |        |         |                 |              |          |        |         |      |
| 202 | CC            |       | 3     |       | 1072   |       |              | T/01             |             |        | 1710    |                 |              | 1719     |        | - 1     | L728 |
| non |               | · in  | r gga | · ccc | . IGI  | TTT   | TCC          | TAT              | TTA         | ATT    | TTC     | TTA             | TCA          | ACC      | CTT    | TAA     | TTA  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 1737  | 7     |       | 1746   |       |              | 1755             |             |        | 1764    |                 | :            | 1773     |        | 1       | L782 |
| GGC | AAA           | A GAT | TTA 7 | ATT   | AGT    | ACC   | CTC          | ATT              | GTA         | GCC    | ATG     | GGA             | AAA          | TTG      | ATG    | TTC     | AGT  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 1791  | L     |       | 1800   |       |              | 1809             |             |        | 1818    |                 |              | 1827     |        | 1       | 926  |
| GGG | GAT           | CAC   | ; TGA | ATT   | AAA    | TGG   | GGT          | CAT              | ACA         | AGT    | ATA     | AAA             | ልጥጥ          | 444      | 222    | 222     |      |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 1845  | i     |       | 1854   |       |              | 1863             |             |        | 1872    |                 |              | 1001     |        |         |      |
| GAC | TTC           | ATO   | CCC   | AAT   | CTC    | АТА   | TGA          | TGT              | GGA         | AGA.   | እርጥ     | COM             | 202          | COOT     | 3.00   |         | .890 |
|     |               |       |       |       |        |       | LON          | 101              | GGA         | AGA    | ACI     | GII             | AGA          | GAG      | ACC    | AAC     | AGG  |
|     |               | 1899  |       |       | 1000   |       |              |                  |             |        |         |                 |              |          |        |         |      |
| GTA |               |       | . mac | 3.03  | T200   |       | ~~~          |                  |             |        | 1926    |                 | 3            | 1935     |        | 1       | 944  |
| JIA | GIG           | GGI   | TAG   | AGA   | TTT    | CCA   | GAG          | TCT              | TAC         | ATT    | TTC     | TAG             | AGG          | AGG      | TAT    | TTA     | ATT  |
|     |               | 1050  |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 1953  |       |       | 1962   |       | 7            | 1971             |             | :      | 1980    |                 | 1            | 1989     |        | 1       | 998  |
| TCT | TCT           | CAC   | TCA   | TCC   | AGT    | GTT   | GTA          | TTT              | AGG         | AAT    | TTC     | CTG             | GCA          | ACA      | GAA    | CTC     | ATG  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 2007  |       | :     | 2016   |       | · ·2         | 2025             |             | 2      | 2034    |                 | 2            | 043      |        | 2       | 052  |
| GCT | TTA           | ATC   | CCA   | CTA   | GCT    | ATT   | GCT          | TAT              | TGT         | CCT    | GGT     | CCA             | ΔΤΤ          | CCC      | ידגג   | ጥአር     | COTO |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 2061  |       | :     | 2070   |       | 2            | 079              |             | 5      | 2022    |                 | 2            | 007      |        |         | 106  |
| TGT | CTT           | GGA   | AGA   | AGT   | GAT    | TTC   | TAG          | GTT              | CAC         | CAT    | ייע מיי | CCA             | 202          | mma      | mma    | mm'a-   | 700  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 2115  | m a C |       | 2124   |       |              | 122              |             |        |         |                 |              |          |        |         |      |
| AAG | TOT           | CCN   | TAC   | cod   | mma    | m. a  | <i>-</i>     | 133              |             | 2      | 142     |                 | 2            | 151      |        | 2       | 160  |
|     | 101           | GCA   | TAG   | GGC   | IIA    | TAG   | CAA          | GTT              | ATT         | TAT    | TTT     | TAA             | AAG          | TTC      | CAT    | AGG '   | TGA  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 | <del>-</del> |          |        |         |      |
|     |               | 2169  |       | 2     | 2178   |       | 2            | 187              |             | 2      | 196     |                 | 2            | 205      |        | 2:      | 214  |
| TTC | TGA           | TAG   | GCA   | GTG   | AGG    | TTA   | GGG          | AGC              | CAC         | CAG    | TTA     | TGA             | TGG          | GAA      | GTA    | TGG 2   | AAT  |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     |               | 2223  |       | 2     | 2232   |       | 2            | 241              |             | 2      | 250     |                 | 2            | 259      |        | 2.      | 268  |
| GGC | AGG           | TCT   | TGA   | AGA   | TAA    | CAT   | TGG          | CCT              | TTT         | GAG    | TGT     | CAC             | TCG          | ב) מיד   | CTC .  | CAA 7   | . am |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |
|     | :             | 2277  |       | 2     | 286    |       | 2            | 295              |             |        | 304     |                 |              |          |        | _       |      |
| GAG |               |       | TTC   | AGG   | ACC    | ATC   | יייינים<br>ב | יייגייי<br>דאייי | entro       | cca 2  | 204     | ma~             |              | 3 I S    | ma-    | 23      | 322  |
|     |               |       |       |       |        | -11.5 | C11          | TVI              | 116         | فاتات  | CIT     | IGT             | ن CA         | GTA      | TGG .  | AAC A   | 4GG  |
| -   |               | 227   |       |       | 240    |       |              |                  |             |        |         |                 |              |          |        |         |      |
| ~~  |               | 2331  |       | 2     | 340    |       | 2            | 349              |             | 2      | 358     |                 | 2            | 367      |        | 23      | 376  |
| GAC | TTT           | GAG   | ACC   | AGG   | AAA    | GCA . | ATC '        | TGA              | CTT         | AGG۱   | CAT     | GGG .           | AAT (        | CAG      | GCA !  | TTT 7   | TG   |
|     |               |       |       |       |        |       |              |                  |             |        |         |                 |              |          |        |         |      |

### FIG. 2D

| CTT             | CTG A   | GG GGC   | TAT                 | TAC   | CAA                     | GGG                      | TTA   | ATA                     | GGT                      | TTC  | ATC                     | TTC               | AAC   | AGG                       | ATA                      | TGA  |
|-----------------|---|--|---------------------|---|-------------------------|--------------------------|---|-------------------------|--------------------------|--|-------------------------|-------------------|---|---------------------------|--------------------------|--|
|                 |   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
|                 |   | 39   | :                   | 2448  |                         |                          | 2457  |                         | :                        | 2466   |                         |                   | 2475  |                           |                          | 2484   |
| CAA             | CAG T   | GT TAA   |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           | TCA                      | TAT  |
|                 |   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
|                 | 24:   |  |                     | 2502  |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
| ATG             | TGG T   |  |                     | TTT   |                         |                          |   |                         |                          | AGG  | TTC                     | CCT               | GAT   | ATG                       | GAT                      | TCC  |
|                 | 25  |  |                     | 2556  |                         |                          |   |                         |                          | 2574   |                         |                   |   |                           |                          |  |
| тат             | AAC A   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
| 141             |   |  |                     |   |                         |                          |   |                         |                          |  |                         | 111               | GGA   | AAT                       | GCC                      | TAT  |
|                 | 26  |  |                     | 2610  |                         |                          |   |                         |                          |  |                         |                   | 2637  |                           |                          | 2646   |
| TTA             | ATA C   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
|                 |   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
|                 | 26  | 55   | :                   | 2664  |                         | :                        | 2673  |                         | 2                        | 2682   |                         | :                 | 2691  |                           |                          | 2700   |
| TGA             | ATG T   | CA TCT   | CTG                 | TTC   | ATC                     | ATT                      | GAC   | TGC                     | TCT                      | TTG  | CTC                     | ATC               | ATT   | GAA                       | TCC                      | CCC  |
|                 |   |  |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           |                          |  |
|                 | 270   |  |                     | 2718  |                         |                          |   |                         |                          |  |                         |                   |   |                           | :                        |  |
| AGC             | AAA G   | rg cct   | AGA                 | ACA   | AAT                     | TAG                      | TGC   | TTA                     | TGC                      | TTG  | ACA                     | CCG               | GTT   | ATT                       |                          |  |
|                 |   |  |                     |   |                         |                          |   |                         |                          |  | ~                       |                   |   |                           |                          |  |
|                 |   |  |                     |   |                         |                          |   |                         | _                        |  |                         |                   |   |                           |                          |  |
|                 |   | 63   |                     |   |                         |                          |   |                         |                          |  |                         |                   |   |                           | :                        | 808  |
| CAA             | ACC TO  |  | CTT                 | CTG   | TCC                     | TGA                      | ACA   | CAT                     | AGC                      | CAG  | GCA                     | ATT               | TTC   | CAG                       | CCT                      |  |
| CAA             | ACC TO  | GA TTC   | CTT                 | CTG   | TCC                     | TGA                      | ACA   | CAT                     | AGC                      | CAG  | GCA                     | ATT               | TTC   | CAG                       | CCT                      | TCT  |
|                 | ACC TO<br>28:   | GA TTC   | CTT                 | CTG<br><br>2826   | TCC                     | TGA                      | ACA<br><br>2835   | CAT                     | AGC                      | CAG<br><br>2844  | GCA                     | ATT               | TTC<br><br>2853   | CAG                       | CCT                      | TCT<br><br>2862  |
|                 | ACC TO  | GA TTC   | CTT                 | CTG<br><br>2826   | TCC<br><br>AAT          | TGA                      | ACA<br><br>2835   | CAT<br>CAT              | AGC                      | CAG<br>2844<br>TTC   | GCA<br><br>CAA          | ATT<br><br>TGT    | TTC<br><br>2853<br>GAG  | CAG<br><br>TGG            | CCT                      | TCT<br>2862<br>TGA   |
|                 | ACC TO<br>28:   | GA TTC<br><br>17<br>GG GTA                     | CTT<br>TTA          | CTG<br><br>2826<br>TTA  | TCC                     | TGA<br>TCT               | ACA<br><br>2835<br>GGC  | CAT                     | AGC<br><br>TAC           | CAG<br>2844<br>TTC   | GCA<br><br>CAA          | ATT               | TTC<br>2853<br>GAG  | CAG<br>TGG                | CCT                      | TCT<br>2862<br>TGA   |
| TTG             | ACC TO<br>28:   | GA TTC<br><br>17<br>GG GTA<br>                 | CTT<br>TTA          | CTG<br><br>2826<br>TTA<br><br>2880  | TCC                     | TGA<br>TCT               | ACA<br><br>2835<br>GGC<br><br>2889  | CAT<br>CAT              | AGC<br>TAC               | CAG<br><br>2844<br>TTC<br><br>2898   | GCA<br><br>CAA          | ATT               | TTC<br><br>2853<br>GAG<br><br>2907  | CAG<br><br>TGG            | CCT                      | TCT<br><br>2862<br>TGA<br>   |
| TTG             | 28:<br>AGT TO<br>28:  | GA TTC<br><br>17<br>GG GTA<br><br>71<br>AA TTT | CTT<br>TTA<br>CTA   | CTG<br><br>2826<br>TTA<br><br>2880  | TCC AAT CTG             | TGA<br>TCT<br>           | ACA<br>2835<br>GGC<br><br>2889<br>CAT   | CAT CAT AAA             | AGC<br>TAC               | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC  | GCA CAA                 | ATT TGT TGT       | TTC<br><br>2853<br>GAG<br><br>2907<br>GCA   | CAG<br><br>TGG<br><br>GCC | CCT                      | TCT<br><br>2862<br>TGA<br>   |
| TTG             | 283<br>AGT TO<br>283<br>GTG CA                                    | GA TTC 17 GG GTA 71 AA TTT 25                  | CTT<br>TTA<br>CTA   | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934   | TCC AAT CTG             | TGA<br>TCT<br>           | ACA<br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943   | CAT CAT AAA             | AGC<br>TAC<br>ACC        | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952  | GCA<br>CAA<br><br>CCA   | TGT               | TTC<br><br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961                                   | TGG<br><br>GCC            | CCT                      | TCT<br><br>2862<br>TGA<br><br>2916<br>CAT<br>  |
| TTG             | 28:<br>AGT TO<br>28:<br>GTG CI                                    | GA TTC 17 GG GTA 71 AA TTT 25                  | CTT<br>TTA<br>CTA   | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934   | TCC AAT CTG             | TGA<br>TCT<br>           | ACA<br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943   | CAT CAT AAA             | AGC<br>TAC<br>ACC        | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952  | GCA<br>CAA<br><br>CCA   | TGT               | TTC<br><br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961                                   | TGG<br><br>GCC            | CCT                      | TCT<br><br>2862<br>TGA<br><br>2916<br>CAT<br>  |
| TTG             | 283<br>AGT TO<br>283<br>GTG CA                                    | GA TTC 17 GG GTA 71 AA TTT 25                  | CTT TTA CTA TGT     | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC                                    | AAT CTG TTG             | TGA<br>TCT<br>GCT        | ACA<br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC                                    | CAT CAT AAA TAT         | AGC<br>TAC<br>ACC        | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA                                   | GCA CAA CCA CAC         | TGT<br>TGT        | TTC<br><br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA                            | CAG TGG GCC AAT           | AAG                      | TCT<br><br>2862<br>TGA<br><br>2916<br>CAT<br>  |
| TTG             | 28:<br>AGT TC<br>28:<br>GTG CI<br>29:<br>GAC A:                   | GA TTC 17 GG GTA 71 AA TTT 25 TT AAA           | CTT TTA CTA TGT     | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br>                                | AAT CTG TTG             | TGA<br>TCT<br>GCT<br>GGA | ACA<br><br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br>                            | CAT CAT AAA TAT         | AGC<br>TAC<br>ACC<br>GTG | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3006                       | GCA CAA CCA CAC         | TGT<br>TGT<br>AGA | TTC 2853 GAG 2907 GCA 2961 GTA 3015   | CAG TGG GCC AAT           | AAG                      | TCT<br>2862<br>TGA<br>2916<br>CAT<br><br>2970<br>CAG                                   |
| TTG             | 28:<br>AGT TC<br>28:<br>GTG C2<br>29:<br>GAC A3                   | GA TTC 17 GG GTA 71 AA TTT 25 TT AAA           | CTT TTA CTA TGT CTG | CTG<br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA                     | AAT CTG TTG             | TGA<br>TCT<br>GCT<br>GGA | ACA<br><br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br>                            | CAT CAT AAA TAT AGA     | AGC TAC ACC GTG GCC      | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3006<br>AAA                | GCA CAA CCA CAC CAC CAC | TGT<br>TGT<br>AGA | TTC<br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA<br><br>3015<br>TCA             | CAG TGG GCC AAT TTT       | CCT AAG TTT CAC          | TCT<br>2862<br>TGA<br>2916<br>CAT<br>2970<br>CAG<br><br>3024<br>ACT                    |
| TTG             | ACC TO  | GA TTC   | CTA CTA TGT         | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA                 | AAT CTG TTG AAA         | TGA TCT GCT GCT CTG      | 2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>2997<br>TGC                        | CAT CAT AAA TAT AGA     | AGC TAC ACC GTG GCC      | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3006<br>AAA                | GCA CAA CCA CAC CAC CT  | TGT<br>TGT<br>AGA | TTC<br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA<br><br>3015<br>TCA             | CAG TGG GCC AAT TTT       | CCT                      | TCT<br>2862<br>TGA<br>2916<br>CAT<br>2970<br>CAG<br>3024<br>ACT                        |
| TTG CAT GTT     | ACC TG 283 AGT TG 287 GTG CG 292 GAC AG 297 CCT GG 303            | GA TTC   | CTA CTA TGT         | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA<br>             | TCC AAT CTG TTG AAA     | TGA TCT GCT GGA CTG      | ACA<br><br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>2997<br>TGC<br><br>3051 | CAT CAT AAA TAT AGA     | AGC TAC ACC GTG GCC      | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3006<br>AAA<br>            | GCA CAA CCA CAC CAC     | TGT TGT AGA       | TTC<br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA<br><br>3015<br>TCA             | CAG TGG GCC AAT TTT       | AAG<br>TTT<br>CAC        | TCT<br>2862<br>TGA<br><br>2916<br>CAT<br><br>2970<br>CAG<br><br>3024<br>ACT            |
| TTG CAT GTT     | ACC TO  | GA TTC   | CTA CTA TGT         | CTG<br><br>2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA<br>             | TCC AAT CTG TTG         | TGA TCT GCT GGA CTG      | ACA<br><br>2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>2997<br>TGC<br><br>3051 | CAT CAT AAA TAT AGA     | AGC TAC ACC GTG GCC      | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3006<br>AAA<br>            | GCA CAA CCA CAC CAC     | TGT TGT AGA       | TTC<br>2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA<br><br>3015<br>TCA             | CAG TGG GCC AAT TTT       | AAG<br>TTT<br>CAC        | TCT<br>2862<br>TGA<br><br>2916<br>CAT<br><br>2970<br>CAG<br><br>3024<br>ACT            |
| TTG CAT GTT     | ACC TC 283 AGT TC 287 GTG C2 297 GAC AM CCT GC GAC ACC TC C       | GA TTC   | CTTA CTA TGT CTG    | 2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA<br><br>3042<br>ACG         | AAT CTG TTG AAA         | TGA TCT GCT GGA CTG CAG  | 2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>2997<br>TGC<br><br>3051            | CAT CAT AAA TAT AGA GAT | AGC TAC ACC GTG GCC AAG  | CAG 2844 TTC 2898 CTC 2952 TTA 3006 AAA 3060 TGA   | CAA CCA CAC CAC CAC AAA | TGT TGT AGA CTG   | 2853<br>GAG<br><br>2907<br>GCA<br><br>2961<br>GTA<br><br>3015<br>TCA<br><br>3069<br>AAG | CAG TGG GCC AAT TTT TAC   | CAC                      | TCT<br>2862<br>TGA<br>2916<br>CAT<br>2970<br>CAG<br><br>3024<br>ACT<br><br>3078<br>TGT |
| TTG CAT GTT AAG | ACC TC 283 AGT TC 287 GTG CZ 297 GAC AT 297 CCT GC 303 ACT TC 308 | GA TTC   | CTA CTA TGT CTG     | 2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA<br>3042<br>ACG<br><br>8096 | AAT CTG TTG AAA AGG     | TGA TCT GCT GGA CTG CAG  | 2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>797<br>TGC<br><br>3051             | CAT CAT AAA TAT AGA GAT | AGC TAC ACC GTG GCC AAG  | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3066<br>AAA<br>3060<br>TGA | GCA CCA CAC CCT AAA     | TGT TGT AGA CTG   | TTC 2853 GAG 2907 GCA 2961 GTA 3015 TCA 3069 AAG 3123                                   | CAG TGG GCC AAT TTT TAC   | AAG<br>TTT<br>CAC<br>GCA | TCT 2862 TGA 2916 CAT 2970 CAG 3024 ACT 3078 TGT                                       |
| TTG CAT GTT AAG | ACC TC 283 AGT TC 287 GTG C2 297 GAC AM CCT GC GAC ACC TC C       | GA TTC   | CTA CTA TGT CTG     | 2826<br>TTA<br><br>2880<br>TAC<br><br>2934<br>GAC<br><br>2988<br>AAA<br>3042<br>ACG<br><br>8096 | TCC AAT CTG TTG AAA AGG | TGA TCT GCT GGA CTG CAG  | 2835<br>GGC<br><br>2889<br>CAT<br><br>2943<br>AGC<br><br>2997<br>TGC<br><br>3051            | CAT CAT AAA TAT AGA GAT | AGC TAC ACC GTG GCC AAG  | CAG<br><br>2844<br>TTC<br><br>2898<br>CTC<br><br>2952<br>TTA<br><br>3066<br>AAA<br>3060<br>TGA | GCA CCA CAC CCT AAA     | TGT TGT AGA CTG   | TTC 2853 GAG 2907 GCA 2961 GTA 3015 TCA 3069 AAG 3123                                   | CAG TGG GCC AAT TTT TAC   | AAG<br>TTT<br>CAC<br>GCA | TCT 2862 TGA 2916 CAT 2970 CAG 3024 ACT 3078 TGT                                       |

AAA A 3'

Figure 3: Protein Sequence for 101P3A11 (piece of SEQ IN M: 2880)

MVDPNGNESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDILI STSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLRHATVLTLPRVTKIGV AAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYL LILKTVLGLTREAQAKAFGTCVSHVCAVFIFYVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYG VKTKEIRQRILRLFHVATHASEP

#### Figure 4

Alignment of 101P3A11 (Sbjct) with mouse olfactory receptor S25 (Query)

- Query: 34 GNYTVVTEFILLGLTDDITVSVILFVMFLIVYSVTLMGNLNIIVLIRTSPQLHTPMYLFL 93
  GN + T FIL+GL L +Y + ++GNL II ++RT LH PMY+FL
- Sbjct: 6 GNESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFL 65
- Query: 94 SHLAFLDIGYSSSVTPIMLRGFLRKGTFIPVAGCVAQLCIVVAFGTSESFLLASMAYDRY 153
- L+ +DI S+S P ML F T I C+ Q+ + + ES +L +MA+DRY
  Sbjct: 66 CMLSGIDILISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRY 125
- Query: 154 VAICSPLLYSTQMSSTVC1LLVGTSYLGGWVNAW1FTGCSLNLSFCGPNKINHFFCDYSP 213
- Sbjct: 126 VAICHPLRHATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQD 185
- Query: 214 LLKLSCSHDFSFEVIPAISSGSIIVVTVFIIALSYVYILVSILKMRSTEGRQKAFSTCTS 273 ++KL+C V I S I + +I+ SY+ IL ++L + + E + KAF TC S
- Sbjct: 186 VMKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVS 244
- Query: 274 HLTAVTLFFGTITFIYVMPQSSYSTDQNK----VVSVFYTVVIPMLNPLIYSFRNKEVKE 329
- H+ AV +F+ + FI + +S ++ ++++ Y +V P+LNP++Y + KE+++
  Sbjct: 245 HVCAVFIFY--VPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQ 302
- Query: 330 AMKKL 334 (SEQ IS NO: 2881)
- + +L Sbjct: 303 RILRL 307 (SEQ In No: 2822)

Figure 23: Alignment of 101P3A11-PHOR-1 with the rat GPCR RA1C (gi|3420759).

Identities = 179/299 (59%), Positives = 231/299 (76%), Gaps = 1/299 (0%)

- PHOR: 14 FILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDI 73 F+LIG+PGLEEA FW FPL S+Y +A+ GN +++IVRTE SLH PMY+FLCML+ ID+
- RAIC: 11 FMLIGIPGLEEAHFWFGFPLLSMYAVALFGNCIVVFIVRTERSLHAPMYLFLCMLAAIDL 70
- PHOR: 74 LISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLR 133 +STS+MPK+LA+FWF+S I FDACL Q+F IH+LS +EST+LLAMAFDRYVAICHPLR
- RA1C: 71 ALSTSTMPKILALFWFDSREITFDACLAQMFFIHALSAIESTILLAMAFDRYVAICHPLR 130
- PHOR: 134 HATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDD 193
  HA VL +IG+ A+VRG+ PLP+ IK+L FC SN+LSHSYC+HQDVMKLA D
- RAIC: 131 HAAVLNNTVTVQIGMVALVRGSLFFFPLPLLIKRLAFCHSNVLSHSYCVHQDVMKLAYTD 190
- PHOR: 194 IRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSHVCAVFIF 252 NVVYGL I+ +G+D + IS SY LI++ VL L ++ +AKAFGTCVSH+ V F
- RAIC: 191 TLPNVVYGLTAILLVMGVDVMFISLSYFLIIRAVLQLPSKSERAKAFGTCVSHIGVVLAF 250
- PHOR: 253 YVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRILRLFHVA 311 (EQ TP M: 1223)
- YVP IGLS+VHRF D + V++ ++YLL+PPV+NPI+YG KTK+IR R+L +F ++
  RAIC: 251 YVPLIGLSVVHRFGNSLDPIVHVLMGDVYLLLPPVINPIIYGAKTKQIRTRVLAMFKIS 309 (YEQ IN NO: 2274)

Figure 24: Alignment of 101P3All-PHOR-1 with the human prostate specific GPCR.(gi|13540539)

Identities = 179/299 (59%), Positives = 233/299 (77%), Gaps = 1/299 (0%)

- PHOR: 14 FILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLCMLSGIDI 73
  F+LIG+PGLE+A FW+ FPL S+Y++A+ GN +++IVRTE SLH PMY+FLCML+ ID+
- GPCR: 11 FVLIGIPGLEKAHFWVGFPLLSMYVVAMFGNCIVVFIVRTERSLHAPMYLFLCMLAAIDL 70
- PHOR: 74 LISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYVAICHPLR 133 +STS+MPK+LA+FWF+S I F+ACL Q+F IH+LS +EST+LLAMAFDRYVAICHPLR
- GPCR: 71 ALSTSTMPKILALFWFDSREISFEACLTQMFFIHALSAIESTILLAMAFDRYVAICHPLR 130
- PHOR: 134 HATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDVMKLACDD 193 HA VL +IG+ AVVRG+ PLP+ IK+L FC SN+LSHSYC+HQDVMKLA D
- HA VL +IG+ AVVRG+ PLP+ IK+L FC SN+LSHSYC+HQDVMKLA D GPCR: 131 HAAVLNNTVTAQIGIVAVVRGSLFFFPLPLLIKRLAFCHSNVLSHSYCVHQDVMKLAYAD 190
- PHOR: 194 IRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSHVCAVFIF 252
- NVVYGL I+ +G+D + IS SY LI++TVL L ++ +AKAFGTCVSH+ V F GPCR: 191 TLPNVVYGLTAILLVMGVDVMFISLSYFLIIRTVLQLPSKSERAKAFGTCVSHIGVVLAF 250
- PHOR: 253 YVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRILRLFHVA 311 (SEQ IS NO: 2885)

  YVP IGLS+VHRF + V++ +IYLL+PPV+NPI+YG KTK+IR R+L +F ++
- YVP IGLS+VHRF + V++ +IYLL+PPV+NPI+YG KTK+IR R+L +F ++
  GPCR: 251 YVPLIGLSVVHRFGNSLHPIVRVVMGDIYLLLPPVINPIIYGAKTKQIRTRVLAMFKIS 309 (SEQ IN M: 2886)

Figure 25: Alignment with human olfactory receptor 5II12 (gi|14423836)

Identities = 163/304 (53%), Positives = 214/304 (69%), Gaps = 1/304 (0%)

- PHOR: 7 NESSATYFILIGLPGLEEAQFWLAFPLCSLYLIAVLGNLTIIYIVRTEHSLHEPMYIFLC 66 N + +F+L G+PGLE + WL+ PLC +Y +A+ GN I+ VR E SLHEPMY FL
- HOR5: 5 NVTHPAFFLLTGIPGLESSHSWLSGPLCVMYAVALGGNTVILQAVRVEPSLHEPMYYFLS 64
- PHOR: 67 MLSGIDILISTSSMPKMLAIFWFNSTTIQFDACLLQIFAIHSLSGMESTVLLAMAFDRYV 126 MLS D+ IS +++P +L F N+ I FDACL+Q+F IH S MES +LLAM+FDRYV
- HOR5: 65 MLSFSDVAISMATLPTVLRTFCLNARNITFDACLIQMFLIHFFSMMESGILLAMSFDRYV 124
- PHOR: 127 AICHPLRHATVLTLPRVTKIGVAAVVRGAALMAPLPVFIKQLPFCRSNILSHSYCLHQDV 186
  AIC PLR+ATVLT + +G+ A R + PLP IK+LP CRSN+LSHSYCLH D+
- HOR5: 125 AICDPLRYATVLTTEVIAAMGLGAAARSFITLFPLPFLIKRLPICRSNVLSHSYCLHPDM 184
- PHOR: 187 MKLACDDIRVNVVYGLIVIISAIGLDSLLISFSYLLILKTVLGL-TREAQAKAFGTCVSH 245
- M+LAC DI +N +YGL V++S G+D I SY+LIL++V+ +RE + KA TCVSH HOR5: 185 MRLACADISINSIYGLFVLVSTFGMDLFFIFLSYVLILRSVMATASREERLKALNTCVSH 244
- PHOR: 246 VCAVFIFYVPFIGLSMVHRFSKRRDSPLPVILANIYLLVPPVLNPIVYGVKTKEIRQRIL 305
- + AV FYVP IG+S VHRF K + V+++N+YL VPPVLNP++Y KTKEIR+ I HOR5: 245 ILAVLAFYVPMIGVSTVHRFGKHVPCYIHVLMSNVYLFVPPVLNPLIYSAKTKEIRRAIF 304
- PHOR: 306 RLFH 309 (SEQ 370 NO: 2887)
  - R+FH

HOR5: 305 RMFH 308 (SEQ TR NO: 2888)